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SATURDAY MAY 14 1955

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 14 1955

OPPORTUNITIES FOR MEDICAL PRACTICE AT HOME AND ABROAD

BY

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The news that a Government committee has been set up to consider the intake of students into the medical schools has made me decide to publish certain pertinent data which were collected for a lecture entitled "Medical Research and Medical Practice at Home and Abroad." Since I have spent my life as a teacher in Scottish medical schools, it is natural that I should consider the problem under discussion mainly from the Scottish angle. Nevertheless, many of the collected data are of equal importance to the young English graduate.

I have approached this problem in the first instance by considering the composition of the class of medicine in Edinburgh graduating in 1912, the year in which I started my academic career as a medical student. Table I compares the sex distribution and country of origin of

TABLE I.—*Numbers Graduating M.B., Ch.B. in Edinburgh in 1912 and 1952*

Country of Origin	Men		Women		Total	
	1912	1952	1912	1952	1912	1952
Scotland	75	103	7	39	82	142
England ..	38	31	2	3	40	34
Ireland	15	0	1	0	16	0
Wales	4	2	0	0	4	2
India	15	0	0	0	15	0
Commonwealth	39	15	0	0	39	15
Foreign	4	0	2	0	6	0
Total ..	190	151	12	42	202	193

the graduates in medicine in 1912 and in 1952 in Edinburgh. Prior to the first world war, Edinburgh was a medical centre which drew its student population not only from Great Britain but from all parts of the British Commonwealth. At that time some of the medical schools in the Dominions which are now flourishing institutions either did not exist at all or taught medical students only up to the standard of the first or second M.B. (anatomy and physiology). Accordingly large numbers of Colonial and Dominion students came to Britain for their clinical teaching and to obtain a British qualification in medicine. Scottish medical schools were frequently selected by these overseas students for their medical studies. This is perhaps not surprising, since at that time a very large number of Scottish graduates practised medicine in the Dominions and Colonies, and naturally they recommended Scottish educational facilities to potential students. When the new medical schools were created in the Dominions before and after the first world war, many professors of the faculties of medicine were Edinburgh graduates, and so it was only to be expected that Scotland's capital would be a popular choice for overseas students.

During the last 25 years a complete change in the source of origin of medical students in Edinburgh University has occurred, as can be seen from Table I. The overseas students now take their medical degrees in their own institutions, which is as it should be, and the 175 students beginning medicine in Edinburgh every year are selected from the hundreds of applicants mainly domiciled in Great Britain, a small number of places being reserved for students living in those Colonies in which there are no medical schools. Edinburgh has always been a popular choice for English students wishing to study medicine, and in 1954 there were some 333 English applicants for entry to the medical school, of whom 63 were accepted.

I believe it is a sound policy to encourage undergraduate students in the Dominions to undertake their medical studies in their own universities and to fill our quota mainly from the long list of British applicants. In contrast to undergraduate education I believe that the British universities should cater especially for postgraduate education for students from overseas. In this respect Edinburgh has been very successful, since approximately 600 doctors per annum attend the various courses of instruction arranged by the Edinburgh Postgraduate Board. In summary, the points of particular interest in Table I are: (1) The great increase in women medical students: they now comprise approximately 25% of the class. (2) The increase of Scottish students from 40% to 70% of the class. (3) The great reduction in the number of students from Ireland, from Wales, and from overseas.

At this point it is appropriate to consider what happened to the Edinburgh medical students who qualified 40 years ago. Only a small percentage remain to practise in Scotland. What that figure was cannot be ascertained, but I doubt if it was 25% of those who qualified annually as doctors. The great majority of the students from England, the Dominions, and the Colonies who came to Edinburgh for their training returned to their native countries to undertake medical practice. Their example was followed by many Scottish medical graduates, who saw a brighter future in England and overseas than existed for them in Scotland at that time. The Indian Medical Service was a popular choice for many doctors, as were the Sudan Medical Service and the Colonial Medical Service. There appeared to be ample opportunities for every medical graduate of Scottish birth who was prepared to leave Scotland to obtain the type of work which he desired if this was not available to him in his native country.

Opportunities for Practice

Detailed consideration may now be given to the opportunities for practice available at the present time to British graduates in general and Scottish graduates in particular.

During the past 20 years the population of Great Britain has increased by approximately 10%, while the number of doctors on the *Medical Register* has increased by no fewer than 25,594—that is, 45%. The number of persons per doctor in England has fallen from 1,250 in 1930 to 900 in 1953 and in Scotland from approximately 800 to 570 during the same period (*British Medical Journal*, 1955). Even if it were conceded that 20 years ago Great Britain was underdoctored as estimated by modern standards, such a disproportionate increase in the number of doctors compared with the increase of the population would inevitably make it much more difficult for recent medical graduates to obtain suitable posts. The position is particularly serious for Scottish graduates, for not only is the ratio of persons per doctor lower in Scotland than in England but the opportunities for entering practice in England are becoming increasingly difficult. The reason for this is clearly indicated in Table II, which shows that the output of doctors by

TABLE II.—*Great Britain: Increase in Numbers of Medical Students Graduating in Selected Years*

Year	England	% Increase	Scotland	% Increase	Ireland	% Increase
1934	847		471		154	
1937	1,096		593		239	
1940	1,323	56	673	43	315	105
1945	1,268		581		428	
1949	1,436		589		452	
1952	1,848	118	673	43	506	228

the four Scottish medical centres in 1952 has remained the same as it was in 1940, while the annual production of doctors in England has increased from 1,323 to 1,848 during that same period. This has resulted mainly from the expansion of the English provincial medical schools. Attention is also drawn to the great increase in production of doctors which has taken place in Ireland in recent years. The majority of these Irish graduates are unable to obtain work in their own country and accordingly seek employment in Great Britain or the Dominions and Colonies.

It is only natural that preference should be given to local graduates by regional appointment boards in England, provided that the applicants' qualifications are satisfactory. Under these circumstances the young Scottish graduate looking for work will turn his eyes to lands overseas, where so many of his predecessors made such a success of their professional careers. India, Pakistan, Burma, and Ceylon are independent nations with their own medical schools, which are being rapidly expanded so that the medical services of these countries can be staffed by their own graduates. The Indian Medical Service is no longer open to our graduates, and the Sudan Medical Service is now at an end so far as European doctors are concerned. A small number of posts in these countries are advertised from time to time by British commercial firms who want British medical officers to be responsible for the care of their employees, but the number of such posts is so small as to make no difference to the overall picture. When I was in Ceylon four years ago I was told that only three European doctors were practising medicine in Colombo, a city of 425,000 inhabitants.

Practice in the Colonies and Dominions

With regard to the opportunities for British doctors wishing to practise in the Colonies, the medical schools in Hong Kong, Singapore, and the West Indies will presumably be able to meet the medical requirements of these regions in the near future. The University of Ibadan, Nigeria, and Makerere College, Uganda, each have flourishing medical faculties, but for a long time to come the Colonial medical services will require medical officers to carry on the excellent work being done in the African Colonies. The opportunity for private practice in Tanganyika, Uganda, and Kenya is small, since the total European population of British East Africa is only about 60,000 persons, many of whom are Civil Servants who receive free medical care. It should also be remembered that there are a large number of Indian doctors practising in these territories. Two-thirds of the European population of British East Africa is concentrated in Nairobi and the adjacent White Highlands. It is my belief that the number of doctors practising in this region already exceeds the regional requirements. This belief is equally applicable to Salisbury and Bulawayo, in Southern Rhodesia.

As the Colonies can absorb only a small proportion of the British doctors wishing to emigrate, what opportunities exist for them in the great Dominions of Australia, New Zealand, South Africa, and Canada? I have visited all these countries during the past five years, and it seemed to me that the competition for practice was extremely severe, at any rate in the big cities. This impression would appear to be fully justified by the data shown in Table III. During the past 20 years there has been a most remarkable increase in the number of practitioners registered in Australia, New Zealand, South Africa, and Canada. With the exception of Canada, this increase is out of all proportion to the increase in the size of the population that has occurred during the same period. Table IV clearly shows that the reason for this great expansion is the increase in production of doctors by the Dominion medical schools. I have not been able to obtain the figures for the total medical man-power registered in Australia, as medical registers are kept only by each State. I am informed that such registers may be somewhat inaccurate, for the same doctor may be registered in more than one State. The number of doctors registered in Victoria has risen from 2,498 in 1934 to 4,207 in 1954, while in South Australia the comparable figures are 484 and 1,202 respectively. There is ample evidence to suggest that the production of doctors in Australia by the Australian medical schools exceeds the national requirements without including the doctors of British and foreign nationality who have emigrated there in considerable numbers since the war and who will wish to continue to do so in the future.

This matter is well reviewed by Sir Hugh Poate (1953) in an article entitled "The Capacity of the Medical Profession in Australia to Absorb New Doctors." Sir Hugh calculates that the number of new graduates required annually for Australia as a whole is approximately 486. The number of Australians graduating in medicine in Australia in 1948 was 297, but by 1951 and 1952 it had reached the

TABLE III.—*British Dominions: Increase in Total Number of Registered Practitioners Compared with Increase in Population (data obtained from the Dominions Offices)*

Country	Year	Approximate Population in Millions		Approximate % Increase		Total No. of Registered Practitioners	% Increase	Approximate No. of Persons per Doctor	
		European	Non-European	European	Non-European			European	Non-European
South Africa ..	1934	2·0	7·5	37·5	33	2,609	147	766	2,875
	1953	2·75	10			6,437		427	1,553
New Zealand ..	1934	1·6		31		1,410	100	1,135	
	1953	2·1				2,800		750	
Canada	1931	10·4		36		10,020	43	1,028	
	1951	14·0				14,325		977	

huge figure of approximately 650 per annum. In addition to local graduates, some 585 doctors from Great Britain and Ireland and from foreign countries have emigrated to Australia between 1948 and 1952. There can be little doubt, therefore, that Australia is rapidly becoming over-doctored.

TABLE IV.—*British Dominions: Increase in Number of Medical Students Graduating in Selected Years Compared with Increase of Population (data obtained from the "Year Book of the Universities of the Commonwealth")*

Country	Year	Approximate Population in Millions		Approximate % Increase		No. of Students Graduating Annually	% Increase
		European	Non-European	European	Non-European		
South Africa	1938	2·05	8·0	29	25	134	224
	1951	2·65	10·0			435	
New Zealand	1936	1·65		24		39	187
	1951	2·05				112	
Canada	1938	11·5		22		492	62
	1951	14·0				791	
Australia	1934	6·6		33		175	263
	1952	8·8				635	

Conclusion

Sufficient has been said to make it clear that opportunities for medical practice in the Dominions and Colonies for British graduates wishing to emigrate overseas are much fewer to-day than they were 40 years ago. Owing to the overcrowding of the profession and the preference given to local graduates, it is my opinion that it would be unwise for a British graduate in medicine to proceed overseas without first having obtained a salaried appointment in a commercial firm, in a university, in a research institute, or in H.M. Oversea Service, or without having obtained a legal contract safeguarding an offer of an assistantship or partnership in private practice. It is also clear that in Great Britain at the present time the chance of becoming a consultant in hospital practice or a principal or partner in general practice is too difficult and too uncertain. In short, there seems to be an over-production of doctors both in Great Britain and in the Dominions.

Unless reasonable opportunities for employment are going to be made available to potential graduates, not only will the numbers entering medical schools fall, according to the laws of supply and demand, but so will the quality of the entrants. The Government Committee appointed to study this important problem will have to consider whether it is better to allow the laws of supply and demand to operate or whether restriction of entry to medical schools should be enforced. That the former mechanism is already operating would appear to be the case, since the number of students starting medicine in Great Britain and Ireland has declined from 2,725 in 1949–50 to 2,280 in 1953–4 (*Lancet*, 1955). On the other hand, it may be felt that the second course is preferable, as it is obviously a wasteful and expensive business to produce more doctors than are required. The question will then arise whether medical schools should be ordered to reduce their annual intake of medical students by a certain quota or whether they should merely be recommended to do so. In this connexion the problem of the excessive production of doctors by the Irish medical schools will require particular attention. Lastly, it will be necessary to decide whether any proposed reduction in intake should be proportionally the same for every medical school in Great Britain or whether medical centres with a long-established international reputation for medical education should receive special consideration.

My thanks are due to Mr. Jolley, Librarian of the Royal College of Physicians, Edinburgh, for the help he has given me in collecting the data for Tables III and IV.

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DIVERSITIES OF SEX*

BY

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Diversities of sex can be divided into: (1) hermaphroditism, in which the gonads are of both sexes and the external sexual appearances may be male or female or a mixture of both; (2) pseudohermaphroditism, in which the external sexual characteristics are more or less characteristic of the sex opposite to that of the gonads; and (3) homosexuality, a state of affairs in which the libido and sexual urge is directed towards the same anatomical sex and may or may not be associated with recognizable endocrine abnormality.

Hermaphroditism

True hermaphroditism is rare: there is a separate ovary and testis, or an ovo-testis.

Case 1: Woman aged 66.—Her mother died when the patient was 8 years old. She looked after six other children and received no proper schooling. During this period she regarded herself as a woman and wore women's dress, but at the age of 18 realized there was some doubt about her sex and tried to commit suicide on this account. Subsequently she led a vagabond life doing farm work and hawking. She shaved about once a week. For some years she has been becoming progressively bald on the top of the head, after the manner of a man. In May, 1952, she was taken to a welfare institution and transferred to Bensham General Hospital for investigation.

FIG. 1

FIG. 2

FIG. 1.—Case 1. True hermaphroditism. Sex regarded as female; has lived as a female, although general appearance rather masculine. One gonad a testis; the other an ovary. Ketosteroids, 3.8 mg.
FIG. 2.—Case 1. True hermaphroditism. Scrotum on right containing a hydrocele; short phallus with hypospadias orifice on the perineum; no vagina. Testis in the right inguinal canal.

On examination the skin and hair distribution were seen to be those of a man. She had a short stubble of beard, long unclipped hair, but central baldness (Fig. 1). The external genitalia also looked masculine, there being a well-formed scrotum on the right containing a hydrocele, a short penis with a hypospadias orifice on the perineum, and no vagina (Fig. 2). An organ in the right inguinal canal was considered to be an undescended testicle. On closer examination the skin fold on the left side appeared like a labium. The urethra opened on the perineum and there was a slight opening ¾ in. (1.9 cm.) long at the end of

*A paper read to Newcastle-upon-Tyne Obstetrical and Gynaecological Society on March 4, 1955.

the penis, but the scrotum was empty apart from the hydrocele. Urinary 17-ketosteroid estimation was 3.8 mg. per 24 hours.

Laparotomy was performed on June 20 by Mr. David Smith. There was a small uterus with broad ligament and left ovary. No right ovary could be seen. A rudimentary right tube disappeared into the inguinal canal. The gonad was removed from the right inguinal canal for section. Histological examination showed a rudimentary uterus; a Fallopian tube; an ovary with numerous corpora albicantia and calcified vessels, showing in its mesentery large clumps of interstitial cells; a testis with fibrosed seminiferous tubules and grossly increased numbers of Leydig cells. On this side there was in addition a structure which might be a tube of a ductus deferens. Unfortunately it has not been possible to obtain skin or a blood film for determination of chromosomal sex because the patient has been transferred to another hospital.

Pseudohermaphroditism

Pseudohermaphroditism, male and female, is much more common, and is a condition in which the gonads are of one type—testes or ovaries. There are two varieties of male pseudohermaphroditism.

Male Pseudohermaphroditism

(1) Cases with testes and general male external characteristics with the exception of the external genitalia: undescended testes and hypospadias.

Case 2: A girl aged 13.—This girl's mother consulted her home doctor because it was noticed that the child had enlarged genitalia. Otherwise she was very healthy, a good scholar, active, and good at games.

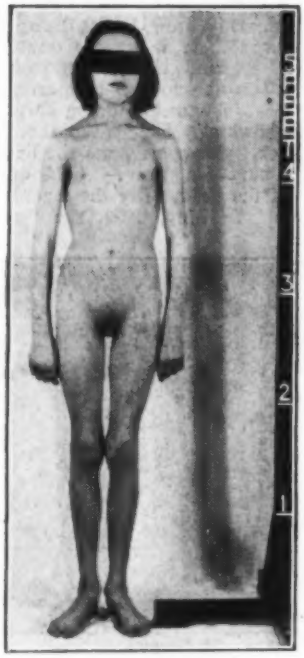

FIG. 3.—Case 2. Male pseudohermaphroditism. "Girl" aged 13. Enlarged "clitoris" and undescended testes. Ketosteroids, 9.6 mg. Has assumed male sex after a plastic operation and hormone treatment.

On examination she was tall for her age and thin, with a deep voice; pubic hair was present (Fig. 3) and the clitoris was enlarged. A swelling in the right inguinal region felt like a testis. She had an infantile vagina with no evidence of cervix or uterus; no breast development. Urinary 17-ketosteroid estimation, 9.6 mg. per 24 hours.

Laparotomy was carried out by Professor Bentley. The right inguinal canal was opened, and what appeared to be a normal testicle for a child of this age was delivered; a biopsy specimen was taken: on microscopy the testicle tissue looked normal. The inguinal canal was then closed. A midline subumbilical incision was made and the pelvis explored. There was no evidence of any rudimentary female viscera. The midline incision was then closed in layers without drainage.

Histologically the specimen was morphologically testis, with well-formed tubules and considerable aggregation of interstitial cells. There was no evident spermatogenesis. The results of the operation suggested, therefore, that this child was essentially a male.

A plastic operation was carried out by Mr. Fenton Braithwaite and the patient has assumed the male sex very successfully.

(2) These are cases with external female characteristics and absence of internal female organs, and in which the gonads are testes and the chromosomal sex is male. This type of male pseudohermaphroditism is commonly mistaken for female, but should always be suspected in a female of adult age who has never menstruated, has no pubic hair, and is without signs of hypopituitarism. Cases have been published by Armstrong (1953) and Beatty, Champ, and Swyer (1953).

Case 3: Girl aged 17.—This patient was referred to hospital on April 22, 1952, because she had never menstruated. She was a twin—the other twin died *in utero*. There was a family history of late menarche. She was of normal stature with well-developed breasts and a normal head of hair. There was no axillary or pubic hair, and her skin was generally somewhat hairless (Fig. 4). The vulva was infantile but otherwise appeared normal. The vagina was only ½ in. (1.3 cm.) in length. On rectal examination no internal female organs were palpated. No abnormal signs were found in the heart, lungs, abdomen, and central nervous system; blood pressure 130/90; urine normal; *x*-ray examination of sella turcica, normal; urinary 17-ketosteroid estimation, 8.9 mg. per 24 hours.

FIG. 4

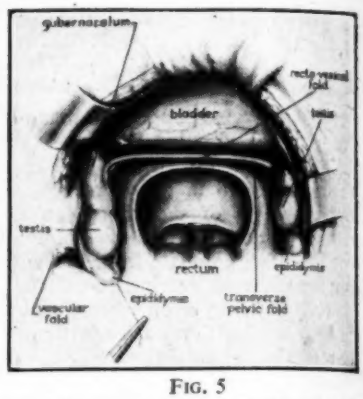

FIG. 5

FIG. 4.—Case 3. Male pseudohermaphroditism. "Girl" aged 17: external feminine characteristics; breasts developed, no pubic hair, infantile female vulva. Gonads undescended testes; no female internal organs and no vagina. Chromosomal sex, male. Ketosteroids, 8.9 mg. Oestrogen excretion in urine: oestriol 2 μg., oestrone 2.4 μg., and oestradiol 0.5 μg., which are at male level.
FIG. 5.—Case 3. Drawing showing appearance of pelvic organs at laparotomy: undescended testes and no female organs.

She had the mental attitude of a girl. Socially and occupationally, the adaptation is that of a girl of 17 of rather above average intelligence. Sexually she is a little immature, but her inclinations are entirely female. She has had girl's toys, has female daydreams, reads love stories, and identifies herself with female fictional and film characters; she hopes to marry and is fond of babies.

At laparotomy there was no uterus, but a broad fold of peritoneum ran across the pelvis in the corresponding position. On the left side, lying on the psoas muscle, was a gonad anatomically resembling a testis. On the right side a similar structure was found, but more inferiorly placed so that it was lying right at the internal ring (Fig. 5). The arrangement was quite consistent with undescended testes. Both inguinal regions were bimanually palpated and no swelling was noted in either groin. The broad fold of peritoneum running across the pelvis is the transverse pelvic fold, a remnant of the uro-rectal septum or genital fold, and its attachment to inguinal fold (gubernaculum) appears almost ligamental and may well have been a factor in checking the descent of the testis. Such an attachment as this occurs in the female from the lateral aspect of the body of the uterus to the ovary, to form the ligament of the ovary.

Material from each gonad was identical histologically and consisted of testicular tissue. There were numerous immature seminiferous tubules which showed no evidence of spermatogenesis. Numerous and increased numbers of interstitial cells were present.

17-Ketosteroid fractionation carried out by Professor Charles H. Gray gave the following results. Total excretion of 17-ketosteroids, 8.8 mg. a day. The 17-ketosteroids could be separated into eight fractions, as follows:

I, II	Containing mainly artefacts of fraction	19%, 0%
III	Transdehydroisoandrosterone	13%
IV	Containing mainly androsterone	18%
V	" acetocholanolone	33%
VI, VII	" 11-oxygenated 17-ketosteroids	11%, 0%
VIII	" unknown artefacts	6%

This fractionation is within normal limits.

Adrenocortical Steroid Analysis (all figures in μg. per 24 hours)

	Δ^4-3-Ketosteroids			Reducing Steroids		
	Free			Glucuronide-conjugated		
	Comp. E	Comp. F	Comp. X_4	Comp. X_8	Tetra-hydro-Comp. E	Unidentified Comps
	20	20	60	80	1,200	240
Normal range:						
Male ..	20–200	10–80	20–120	0–200	240–3,000	0–1,500
Female ..	30–110	10–120	10–320	10–4,000	160–4,000	0–2,200

X_4 and X_8 are unidentified Δ^4-3-ketosteroids with R_F values of 0.24 and 0.39 in benzene/50% methanol system. Excretion of free compound E of 20 μg. a day is within normal limits for males.

Dr. J. E. Gray was of the opinion that the chromosome content of the skin was male.

Professor G. F. Marrian estimated the oestrogen excretion in the urine, and reported the following results:

	1st Week	2nd Week
Oestriol	2·0 μg. ..	1·6 μg.
Oestrone	2·4 „ ..	3·1 „
Oestradiol	0·5 „ ..	1·4 „

These figures are at male level.

The patient whose case was reported by Beatty *et al.* (1953) was admitted to the Royal Victoria Infirmary on December 1, 1954, as an emergency under my care because of haematemesis. Dr. G. I. M. Swyer reported on the oestrogens as follows: oestriol, 2.1 μg. in 24 hours; oestrone, 1.5 μg.; oestradiol, 2.6 μg. This patient intends to marry in the near future.

In both these cases the oestrogen excretion in the urine is at the male level, which suggests enhanced response of target organ to oestrogen or that there is another oestrogen not yet determined.

Female Pseudohermaphroditism

Female pseudohermaphroditism is a condition in which the gonads are ovaries, the chromosomal sex is female, but the external appearance is more or less masculine. Usually there is lack of breast development, with a male type of hair distribution, and the clitoris is enlarged to a degree which resembles a penis but micturition is feminine in type. The condition either is of genetic determination or is due to adrenal hypersecretion, starting in foetal life. These subjects are seldom brought up as boys, and such a case is reported here.

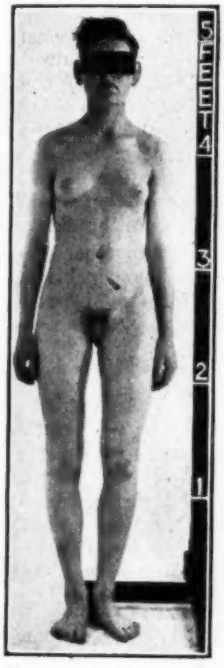

FIG. 6

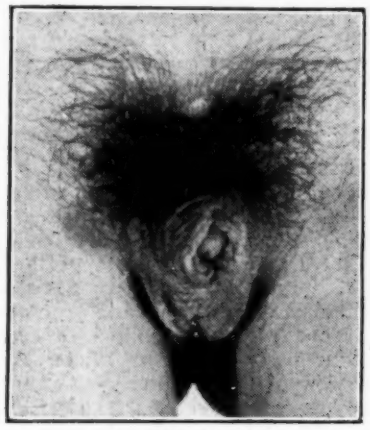

FIG. 7

FIG. 6.—Case 4. Female pseudohermaphroditism. "Boy" aged 16; external genitalia: phallus with appearance of a penis, and urethral opening on the ventral surface. In perineum, two sinuses, from one of which menstrual bleeding occurred. Ketosteroids, 6.3 mg. FIG. 7.—Female pseudohermaphroditism. Photograph shows appearance of external genitalia.

Case 4: Boy aged 16.—This patient was referred to me as a boy with hypospadias which had been repaired by a surgeon 12 months previously, but since then breasts had developed and there was periodic bleeding from a perineal sinus.

On examination he was thoroughly imbued with a boy's mode of behaviour; nevertheless he had a round face with fresh complexion and absence of any facial hair. Pubic hair was present and level (Fig. 6). Breast development was such as would have been consistent with an adolescent girl. External genitalia consisted of a reconstructed phallus with urethral opening on the ventral surface (Fig. 7). In the perineum there were two sinuses, from one of which periodic bleeding occurred. Lipiodol injection showed it to have a connexion with the urethra. Ketosteroids were 6.3 mg. per 24 hours.

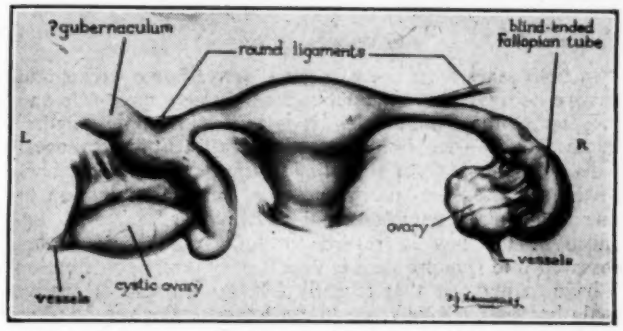

FIG. 8.—Case 4. Female pseudohermaphroditism. Drawing illustrating pelvis at laparotomy; uterus and ovaries present; no male organs.

Laparotomy, carried out by Mr. D. J. Tibbs, revealed a normal adolescent uterus which connected by a rudimentary vaginal canal with the perineal sinus (Fig. 8). Gonads were present in the position of normal ovaries. Biopsy showed them both to contain ovarian tissue histologically. Fallopian tubes were malformed.

This patient has refused to assume female sex.

The more common type of female pseudohermaphroditism has enlarged clitoris, male type of hair distribution, no breast development, and non-establishment of menstruation. These cases of adreno-genital syndrome respond to treatment with cortisone.

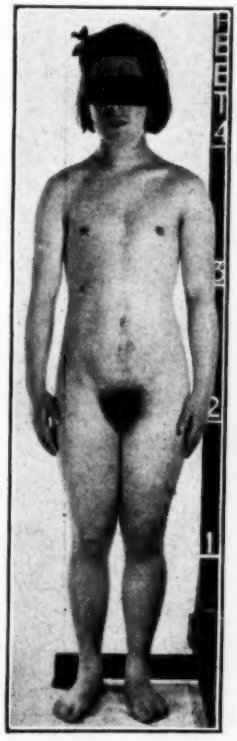

FIG. 9

FIG. 10

FIG. 9.—Case 5. Female pseudohermaphroditism. Girl aged 14. Enlarged clitoris: thick pubic hair, no breast development and no menstruation. Ketosteroids, 23.0 mg. Since above photograph was taken has been treated with cortisone: ketosteroids have dropped to 6 mg., breasts have developed, and menstruation established. FIG. 10.—Case 5. Female pseudohermaphroditism. Photograph showing enlarged clitoris.

Case 5: Girl aged 14.—This patient was referred to me at 11 years of age with the complaint that she was changing her sex. The history was that at 1 year the clitoris was found to be enlarged and at 2½ years pubic hair began to grow. At 4 years laparotomy had demonstrated a normal uterus and ovaries, with histological confirmation. Examination confirmed the presence of a small vagina and separate urethral passage (Fig. 9). The urethral opening is set very far back (Fig. 10). Ketosteroids were 23 mg. The condition in this case was considered to be adrenal hyperplasia. She has continued to be successfully treated with cortisone: the breasts have developed and menstruation has been established.

Homosexuality

In both sexes there are two types, active homosexuals and passive homosexuals—the active assuming the male role and the passive the female role. It is as yet indefinite whether homosexuality—the libido, emotional attraction to another individual, and urge of sexual expression being to a member of the same sex—is inborn and of genetic determination or due to acquired environmental psychological factors. Because of the law in regard to homosexuality in males, research into this problem is urgent. The only contribution I have to make is that recently I have had several passive male homosexuals referred to me for an endocrine opinion, and in each instance I have been able to recognize certain female characteristics.

Case 6: Man aged 22.—This patient was referred to me at Royal Victoria Infirmary in September, 1954. He had previously been admitted to the Department of Psychological Medicine, where it was thought that little could be done to help him. He volunteered the information that he was of the opinion that from very early childhood he had had female tendencies and female habits, and at the age of 13 a neighbour had had homosexual activities with him. Later he used to be called a "cissy." He joined the Royal Navy for his National Service at 18 and was immediately recognized by active homosexuals, which led to frequent physical homosexual practices taking place to a degree which eventually led to his seeking the advice of the padre, who recommended his discharge from the Navy. Since leaving the Royal Navy homosexual intercourse has continued, and he sought the advice of his doctor, who referred him to hospital at the age of 22.

FIG. 11

FIG. 12

FIG. 11.—Case 6. Passive male homosexual, aged 22. Somewhat general feminine appearance and contours; deficient beard—can go without shaving for two weeks without being noticeable; level pubic hair; well-developed genitalia; ketosteroids high normal, 22.2 mg.; and high sperm count, 110 millions per ml. FIG. 12.—Case 7. Passive male homosexual, aged 17. Rather eunuchoid appearance with feminine voice, small penis, level pubic hair, scanty axillary hair, and no facial hair—he does not shave. Ketosteroids, 8.5 mg.

On examination his general appearance had undoubtedly certain feminine characteristics in general contour (Fig. 11). His head hair was male pattern in distribution, but his beard was deficient, and he required to shave only once in three days, and can go as long as two weeks without it being hardly noticeable. Pubic hair was level. Genitalia were well developed. There was no gynaecomastia. Legs were of feminine contour. Urinary 17-ketosteroids were 22.2 mg. per 24 hours. Semen analysis: count, 110,000,000 spermatozoa per ml.; 90% of the normal spermatozoa highly motile and normal in appearance.

There are undoubted feminine endocrine features in this case, together with a high urinary 17-ketosteroid excretion and a high sperm count.

Case 7: Youth aged 17.—This patient wrote direct to me, and the following is an extract from his letter. "I have seen my doctor because ever since I was young I have always felt like a girl and I've always wanted to show I am one. I played with dolls and girls instead of boys. I detest boys' games, but have loved to play girls' games. I love girls' clothes and look into every clothes shop in town. I am now nearly 18, and for just over a year I have been in love with a man, and it grows more sincere as the months go by. I love little children, and some day hope to have some of my own; but I don't want to be a father—a mother is more in my line. I think like a girl, act like one. I've been told I look and try to dress like one; of course I do—anything that makes me look feminine I'll wear. I blush when a handsome man looks at me, and am embarrassed when they start talking about male subjects. My mother and family know about this; I thought it best to tell them. Well, my doctor sent me to a psychiatrist, who asked me everything. She sent me to another; after going five times he sent me to another, who asked the same questions as the others. It started all over again, but none of them have done anything for me; the last one said if I go on like this I will be a homosexual, yet I have done nothing sexual or ever suggested doing it."

On examination he was tall, slender in build and contours, with a rather feminine voice and small penis; testes were descended, pubic hair was level; axillary hair was scanty, and facial hair was absent—he does not shave. Head hair was of male pattern but worn rather long. Urinary 17-ketosteroids were 8.5 mg. per 24 hours. *X*-ray examination of the sella turcica showed nothing abnormal. Semen analysis:—Wet film: The majority of the spermatozoa were actively motile, but several abnormal and immature forms were seen; no pus cells, red blood cells, or crystals present. Count, 21,200,000 per ml. Stained film. Approximately 60% of the spermatozoa showed no morphological abnormalities, but the remaining 40% showed immaturity—swollen or pyknotic heads or other aberrations. There are also an excessive number of spermatids and spermatocytes.

This case is of interest because the patient has always felt that his outlook was female. He has never had any physical homosexual contacts, and there are features—small genitalia, level pubic hair, and absence of beard—that would suggest masculine deficiency amounting to eunuchoidism.

The general form, contours, and appearance, together with deficiency of male type of hair, are easily recognizable in these cases. The ketosteroid excretion in Case 6 is high and in Case 7 low.

Discussion

I should like to draw attention to the fact that there is as yet no precise definition in law or in medicine of what really constitutes male or female sex. I have expressed the opinion (Armstrong, 1953) that the legal sex of an individual is the anatomical structure of the gonads irrespective of the external appearance or social or sexual inclinations. Although most legal authorities would accept this, it is not in fact a true legal definition (*British Medical Journal*, 1954). So far the law has never defined sex, which is extraordinary in view of the homosexual laws in this country, and it is sometimes very difficult to say to which sex an individual belongs. Histological examination of the skin and of the polymorphs will reveal the chromosomal sex of the individual, which corresponds to the gonad sex, but this is not definite proof of the genetic sex. With the exception of the cases of female pseudohermaphroditism the hormone secretion estimations are not what one would have expected.

In Case 3 and in Dr. Swyer's case the oestrogen excretion in the urine is male level, which suggests enhanced response of the target organ to oestrogen or that there is another oestrogen not yet determined. In one of the female-role homosexuals with some signs of feminization the ketosteroid excretion and the sperm count are high. All of this goes to suggest that external sexual characteristics are dependent upon factors other than the level of hormone secretion.

It is obvious from the cases illustrated that it is sometimes not easy to draw a hard-and-fast line between the sexes and define exactly to which sex an individual belongs. In Case 3 the gonads are male and the chromosomal sex is male, and this patient might have a good case in claiming sex as male if the question of legacy, etc., in law arose, but would hardly be likely to be prosecuted for practising female-role intercourse with a male. On the other hand, Case 6 would be liable to be prosecuted, although I submit there are endocrine signs present suggesting a mild degree of feminization: such signs might pass unrecognized by the normal individual, but they are recognized amazingly easily by active male homosexuals. Such passive homosexuals have told me that at boarding school and in the Forces they are pestered by active male homosexuals, even by those they dislike and to whom they give no encouragement. One boy knew all his life that his outlook was female, but he had high moral principles and managed to steer himself through his public school life without physical contact in spite of the fact that he was attacked by the active homosexuals and his life made miserable. These active homosexuals were able to recognize what to me was not clinically obvious, yet I was interested to find that androgen excretion was low in this particular case. There is no doubt that active male homosexuals recognize passive male homosexuals by some means unknown. Is there a sixth sense?

In my experience these passive male homosexuals have really known all their lives that their outlook is female, and if when young they are subjected to interference by adult males this experience is not the initiating cause although often blamed as such.

It seems to me extremely likely that these homosexual characteristics are inborn and of genetic determination; this is supported by the research carried out by Kallmann (1952) on identical twins—both homosexual, although brought up in totally different environments. If this is so, psychoanalysis is a waste of time.

Active male homosexuals may be a different problem: I have had insufficient experience on which to express an opinion.

If passive (female-role) male homosexuality is of genetic determination it is open to consideration whether homosexuals should be subject to prosecution for physical expression of an inborn and genetic characteristic, an urge so strong that some individuals are unable to control it. In spite of the legal attitude towards homosexuality, society regards it as quite in order for a boy visiting a respectable household to have to occupy the same bedroom or even the same bed as the son of the house, for boys' boarding schools to sleep several boys in the same room, for hotels to accommodate two men in the same bedroom, or for British Railways to put two men alone in the same sleeper. The natural sexual urge must obviously be very strong: persons will go through fire and water and put themselves to all manner of hardships to achieve gratification. Nature has to make the instinctive urge strong or the human race would die out. The perverted urge may be no less strong. This is a legal problem, as also is the definition of sex. The medical profession also has a problem in its attitude to these diversities of sex. I think, so far as Cases 2 and 4 are concerned, it should be our duty as medical practitioners to repair physical abnormality and advise the patient to assume his or her true sex.

Case 3 is more difficult; it is obvious that it would be impossible to make the external appearances male. My advice would be to leave alone. I would not advise a plastic vagina and be party to promoting relationships or a marriage which may well end in disaster. I do not consider the medical profession should further pathology. For the same reason I should consider it also wrong for physicians and surgeons to administer hormones and carry out plastic operations on homosexuals with the object of making homosexual transvestists appear more like the opposite sex—converting males into pseudofemales and females into pseudomales.

Summary

Diversities of sex are divided into hermaphroditism, pseudohermaphroditism, and homosexuality, and cases are described illustrating the different types. Attention is drawn to the fact that sex of gonads, chromosomal sex, and hormone excretion may not correspond to the external physical appearances. Passive (female-role) male homosexuals may present certain physical feminine characteristics and, whether this is obvious or not, active (male-role) male homosexuals can readily recognize female-role homosexuals. It is suggested that passive male homosexuality is of physical origin rather than due to psychological environmental circumstances. There is no definition of what constitutes male or female sex in medicine or in law.

The problem of what should be the attitude of the medical profession to this problem is discussed. The opinion is expressed that in cases of pseudohermaphroditism in which the patient's sex is anatomically obvious, with corresponding external characteristics excepting minor abnormality, treatment should be by hormones or plastic surgery and the patient assume the correct sex, but in all other cases of pseudohermaphroditism or homosexuality the medical profession should leave alone and not administer hormones and carry out plastic operations to further an already pathological condition.

I should like to thank Professor Charles Gray for the adrenocortical steroid analysis and Professor Marrian for estimating the oestrogen excretion in Case 3; Dr. J. E. Gray for determining the chromosomal sex; my surgical colleagues, Professor F. H. Bentley, Mr. David Smith, Mr. D. J. Tibbs, and Mr. Fenton Braithwaite, for their help; Professor Alexander Kennedy and Dr. Robert Orton for the psychological investigation of some of the cases; Dr. D. W. R. Ashby for asking me to see Case 1 when under his care; Mr. C. J. Duncan for the photographs; and Mr. D. P. Hammersley for the drawings.

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The possibility of using sulphate-reducing bacteria for the production of hydrogen sulphide, and hence sulphur, is being studied at the Chemistry Research Laboratory of the Department of Scientific and Industrial Research (*Chemistry Research 1954*, H.M.S.O., London). Significant progress has been made, but industrial application is unlikely to be economically attractive under existing conditions. However, the method might well be useful should there be the threat of another sulphur shortage. Sewage sludge is the most promising raw material for sulphide production that has been examined. Three problems have been investigated during the year—the rate of sulphide production in sulphated sludges, the inhibition of methane production, and the possible use of two reactors producing methane and sulphide separately to give a gas mixture from which sulphur could be recovered. Experiments indicate that under certain conditions it may be possible to produce both methane and hydrogen sulphide simultaneously from raw sludge.

TUBERCULIN-TESTING OF A SCHOOL POPULATION (MUSSELBURGH, 1953)

BY

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In recent years the results of tuberculin surveys in England and Wales have been published, and have shown differing degrees of tuberculous infection in different areas of these countries.

The unenviable post-war record of tuberculosis in Scotland is well known. Even after the belated downward trend in mortality had occurred, the notifications continued to increase, a trend which still persists. In view of this alarming situation, it seemed to us that a survey of tuberculin sensitivity in a Scottish area was overdue. It was thought possible that such a survey might show significant differences from the English and Welsh ones, and might conceivably shed some light on the perplexing problem of why the Scottish notification rate has remained proportionately high. No survey of this type has been published from Scotland, and the need to rectify this situation seemed to us to have some urgency, as it is obvious that the impending use of B.C.G. on a wider scale in school-leavers and in tuberculosis contacts will rapidly obscure the true picture of natural tuberculin sensitivity.

Musselburgh can be taken to be a representative Scottish burgh, with a population, including the surrounding area, of 21,800. It lies near Edinburgh, and, while there is a good deal of daily migration to this city, this is not so great as it might be, because there is adequate scope for employment in the town itself. In no sense can it be regarded as merely a dormitory for Edinburgh.

It is not thought that milk-borne bovine tuberculous infection has influenced our results to any great extent. The milk supply has been almost entirely heat-treated for the past ten years, and for some years before that the bulk of the milk sold in the town was retailed from a few dairies which employed heat treatment.

Housing in Musselburgh had been unsatisfactory until the last five or six years, since when much has been done to rehouse the overcrowded slum and tenement dwellers. The housing conditions can be taken to represent a typical picture of Scottish urban life, where overcrowding and poor conditions are commoner and more severe problems than in England.

Methods Used in the Survey

Propaganda was thought to be of great importance in order to secure the co-operation of the parents of the schoolchildren. The local newspaper generously gave space to the subject, and for several weeks before the campaign began articles were published explaining the objects of the scheme and describing the performance of the tests. Various organizations, town council, churches, and political clubs gave valuable support. All the general practitioners were informed of the plan and asked to lend their weight to it.

Each schoolchild was given a leaflet to take home. This explained the tests and contained a consent form which the parent was requested to sign. If consent was not given at the earliest opportunity the child involved was shown the test being carried out and asked to tell his parents how simple it seemed. Thereafter, remarkably few parents withheld their sanction.

The positive reactors were *x*-rayed by the mass radiography unit at school, or in near-by convenient centres. The negative reactors who were within two years of school-leaving age were offered B.C.G. vaccination.

The positive reactors were given letters of explanation to their parents. In these, the significance of the positive test was briefly explained and the parent was given an appointment for interview. This interview was conducted by one of the doctors or by a health visitor, and details were obtained of the child's previous health, the housing conditions, and the home contacts, with their ages and occupations. Time-tables of available *x*-ray sessions in the town were given to the representatives of the family, and they were asked to try to ensure that all the people in the house were *x*-rayed. The response to the invitation to be interviewed was astonishing: 95% of those invited were seen and questioned. The response to the invitation to be *x*-rayed was less impressive, partly because not enough sessions of the mass unit could be secured at hours which did not clash with work.

Skin Tests Employed

The first test was a modified tuberculin jelly test. The skin between the scapulae was cleansed with acetone, six light strokes with flourpaper were given, and the jelly was applied in the form of a T. Control jelly was applied near by and the whole area was then covered by adhesive, which was removed at 48 hours (Dick, 1950). The test was finally read on the fifth day (Lendrum, 1951).

The criteria for acceptance of a test as positive were: (1) erythema and/or induration in the shape of the original application; (2) at least six papules or vesicles in the shape of the original application; and (3) no reaction at the site of application of the control jelly.

In negative reactors to this test a Mantoux test was carried out on the skin of the forearm, using 0.1 ml. of 1 in 100 old tuberculin (1 mg. O.T.). The test was read on the third day, which is thought to exclude some false-positive reactions seen if the tests are read on the second day. The criterion used for a positive reaction was palpable induration 5 mm. or more in diameter.

All the tests were performed and read by a small team of doctors and one experienced tuberculosis health visitor. Where any doubt existed in the interpretation of these tests, consultation between several observers took place.

Statistical Criteria.—Differences are not held to be significant if they are less than three times the standard error of the difference.

An Analysis of the Completeness of the Survey

An attempt was made to determine the tuberculin sensitivity of every schoolchild between the ages of 5 and 15 years in the local authority schools of the Musselburgh area.

Table I examines the success of this attempt by age groups and sets out the lapses by cause. The three age groups chosen correspond as nearly as possible to the three types of school: infants 5 to 7, primary scholars 8 to 11, and secondary scholars 12 to 15.

The total number of children tested (3,282) is 98.2% of the 3,342 children whose parents consented to testing (93.5%

of all the children on the school rolls). This compares favourably with the figures for the Calder Valley (Keidan *et al.*, 1952) and the Rhondda Fach (Jarman, 1953) surveys. The figures for these surveys are set alongside those for Musselburgh in Table II.

In the Rhondda Fach Jarman (1953) found that most of the lapses occurred in the younger age groups. He thought that "the refusal of parents to have their children skin-tested is mainly determined by the age of the child." Our experience on this point is quite strikingly different from his, and to bring this out the Musselburgh figures have been superimposed on Jarman's graphs (Fig. 1).

Effect of Previous Tuberculosis Prevention Work on the Present Survey.—Of the children who were found to be tuberculin-positive during the survey, 101 (64 males and 37 females) were known to have been tuberculin-negative when seen as contacts and to have converted to positive after B.C.G. vaccination. Since we cannot estimate how many of these children would have become positive without B.C.G. vaccination they are excluded from the main analysis of results. The difference this makes to the percentage who were positive was fairly evenly distributed over the age groups.*

TABLE I.—*Acceptances and Lapses in Musselburgh Schoolchildren by Age Groups*

Group	Age*	Total No. on School Rolls	No. Completing the Tests	No. of Lapses, with Reasons			
				Consent Withheld	Absent from All Tests	Consent Received but Test Incomplete	
						1st Test Not Read	1st Test Neg. 2nd Test not Read
Infants	5–7	1,097	1,004	59	18	7	9
Primary scholars	8–11	1,349	1,257	59	23	6	4
Secondary scholars	12–15	1,064	1,021	35	8	0	0
All groups		3,510	3,282	153	49	13	13

* Age is here reckoned as the age of the child on the day of the administration of the first test or, where no tests were given, on the day when the first test was performed on the child's classmates.

TABLE II.—*Response of Schoolchildren in Three Different Tuberculin Surveys*

Area	% on School Rolls Who Completed Tests	% Present at First Test Who Completed Tests	% Whose Parents Consented Who Completed Tests
Calder Valley	85	Not recorded	95·6
Rhondda Fach	71·9	76·0*	85·1*
Musselburgh	93·5	95·4	98·2

* These percentages are calculated from the published figures 3,410 of 4,484 and 3,410 of 4,004 respectively.

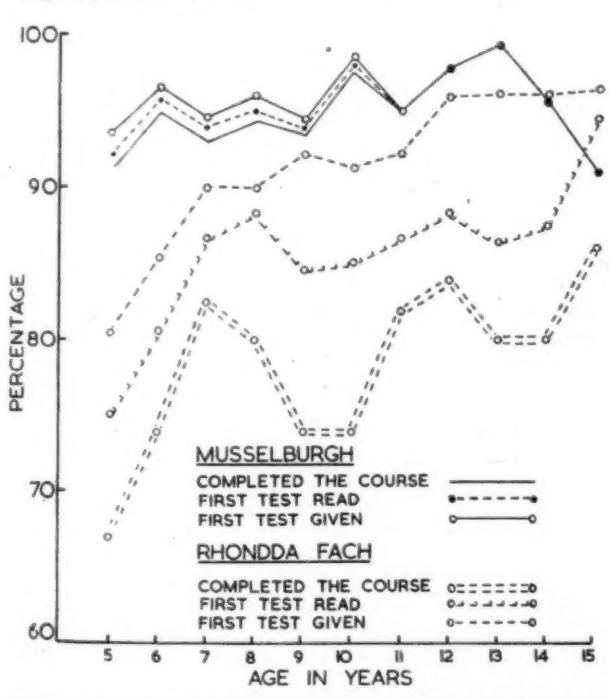

FIG. 1.—Percentage of children present on first day of test who completed each stage of course.

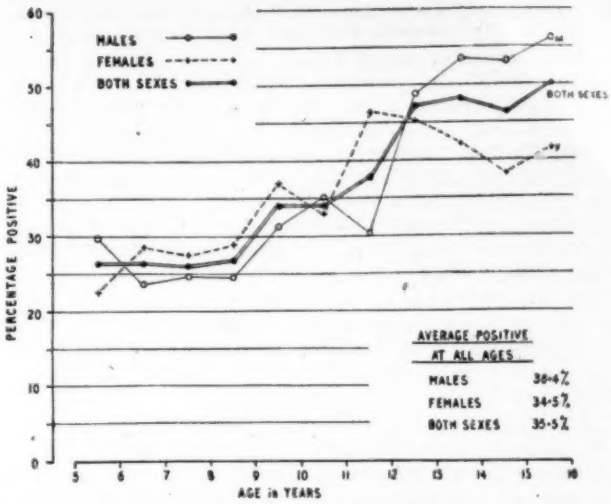

FIG. 2.—Percentage of tuberculin-positive male and female schoolchildren in the area.

TABLE III.—*Sex Variations in the Tuberculin-positive Rate by Year of Age*

Age	Males			Females		
	No. Tested	Tub. Pos.		No. Tested	Tub. Pos.	
		No.	%		No.	%
5	161	48	29·8	155	35	22·6
6	173	41	23·7	192	55	28·1
7	146	36	24·7	146	40	27·4
8	139	34	24·5	159	46	28·9
9	157	49	31·2	146	54	37·0
10	171	60	35·1	164	54	32·9
11	160	50	31·3	123	57	46·3
12	186	91	48·9	155	70	45·2
13	129	69	53·3	116	49	42·2
14	166	88	53·0	139	53	38·1
15	57	32	56·1	41	17	41·5
Total	1,645	598	36·4	1,536	530	34·5

Results of the Tuberculin Tests

The results of the tests are considered by year of age in three different ways: first by sex, then as a whole and in comparison with other areas surveyed, and finally to compare two districts within our own survey area.

(a) Sex Variations in the Tuberculin-positive Rates by Year of Age

The sex variations are graphically represented in Fig. 2, and are set out in Table III. There is no significant difference between the percentage positive in the two sexes for all ages. Taking the ages individually it will be seen that the rates correspond very closely up to the age of 10. Thereafter the differences are in some cases greater, but only at two points do these differences approach significance—at 11 years $t=2.6$ and, again, at 14 years $t=2.6$—but these differences are in opposite directions and we attach no importance to them.

Our results here correspond quite closely with the findings of the National Survey of the Medical Research Council (1952).

*This can be seen by comparing the total percentage positive in each year group in Fig. 4 with the percentages positive for Musselburgh in Table IV. In Fig. 4 the calculations are based on the inclusive figures, which include the 101 children who had had B.C.G. These children were excluded from the figures used for Table IV.

(b) Variations in Tuberculin-positive Rates by Year of Age in Musselburgh and Three Other Areas

In Musselburgh the ages of the 3,181 children tested varied from 5 to 15 years old. From 5 to 14 years the age groups are reasonably comparable so far as numbers are concerned, and only the 13-year group at 245 falls below the standard of "250 persons at each year of age" recommended by the M.R.C. (1952). The 15-year group contains only 98 children, and is relatively much smaller. This is explained by the fact that most children in Musselburgh leave school at the end of the term in which they reach their 15th birthday.

Of the 3,181 Musselburgh schoolchildren tested, 1,128 were tuberculin-positive and 2,053 tuberculin-negative. This 35.5% tuberculin-positive rate compares with 27.7% for the whole of England and Wales, 24.0% for the Rhondda Fach, and 39.0% for Calder Valley.

The Calder Valley results differ from ours and the other two in that children negative to the first test and failing to attend for the reading of the second test were counted as negative. If, as is done in the other surveys, these children are excluded so that the remaining population at risk can be related to the number definitely positive the overall tuberculin-positive rate for the Calder Valley recalculated from the published figure is 40.9%.

The results of the Musselburgh survey are set out in Table IV by age and the results of the other surveys put alongside for comparison. These are also illustrated in Fig. 3.

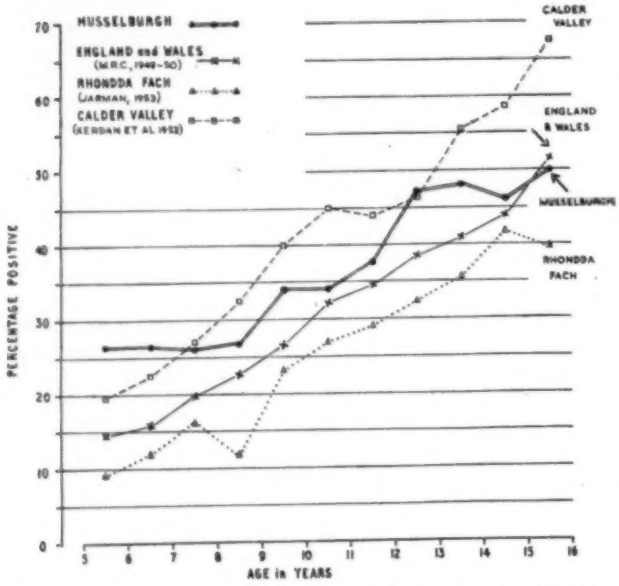

FIG. 3.—Tuberculin-positive rates of Musselburgh schoolchildren compared with those of other areas.

An examination of these figures and graphs shows that Musselburgh differs from the others in three respects. (1) The starting-point (26.3%) is higher than in any of the other areas. In the Calder Valley, which has the next highest starting-point (19.7%), the high initial figure was attributed to milk infection. In Musselburgh the milk is all "designated" milk* and we assume that we are dealing almost entirely with human tuberculosis. (2) The amplitude (26.3% to 50.0%) is smaller than in the other areas. (3) The rise with age occurs in stages in Musselburgh, whereas in the other areas the rise year by year tends to occur more smoothly.

In Musselburgh there would appear to be three quite distinct stages, 5 to 8, 9 to 11, and 12 to 15. Within each group there is no significant difference between the percentage positives from year to year (t is less than 1 in all cases), while between the groups the differences are well marked and are significant.

*Musselburgh is a "designated area." Most of the milk is "pasteurized," some is "tuberculin-tested," and a small amount is "certified."

TABLE IV.—*Variations in Tuberculin-positive Rates by Year of Age in Musselburgh, England and Wales, Rhondda Fach, and Calder Valley*

Age	Musselburgh			% Positive in Other Areas		
	No. Tested	Tuberculin-positive		England and Wales (M.R.C.)	Calder Valley	Rhondda Fach
		No.	%			
5	316	83	26·3	14·5	19·7	9·1
6	365	96	26·3	15·8	22·5	11·9
7	292	76	26·0	19·9	27·1	16·1
8	298	80	26·8	22·6	32·5	11·8
9	303	103	34·0	26·6	40·0	23·1
10	335	114	34·0	32·1	45·0	27·0
11	283	107	37·8	34·5	44·0	29·1
12	341	161	47·2	38·5	46·6	32·3
13	245	118	48·2	40·9	55·5	35·7
14	305	141	46·2	43·9	58·7	41·8
15	98	49	50·0	51·5	67·7	39·7
Total	3,181	1,128	35·5	27·7	39·0	24·0

TABLE V.—*Tuberculin-positive Rates in Musselburgh Schoolchildren in Three Age Groups*

Age Group	No. Tested	Tuberculin-positive			Value of t
		No.	%	S.E.	
5–8	1,271	335	26·36	±1·24	—
9–11	921	324	35·18	±1·57	4·41
12–15	989	469	47·42	±1·61	5·48

It may be worthy of comment that in the Rhondda Fach the results in the 5 to 8 group seem to form a consistent group, although in the later years the Rhondda Fach pattern conforms more to that of the other areas, where the percentage positive rate rises steadily from year to year.

The three age groups representing the rising stages in the tuberculin-positive rates correspond fairly nearly to the scholastic grouping into infant, primary, and secondary scholars (5 to 7, 8 to 11, and 12 to 15), only the one year, 8, being displaced into the younger age group. Table V sets out this grouping and gives the t values for the difference between the infant and primary and between the primary and secondary scholars.

(c) Variations in the Tuberculin-positive Rates by Year of Age in Two Districts Within the Surveyed Area

In an attempt to relate tuberculin-positive rates in schoolchildren to environment certain data relating to social conditions were obtained. These may be fully examined at a later date. It is, however, possible now to compare the results in two quite distinct districts of our survey area—namely, the mining villages of Wallyford and Whitecraig on the one hand and the town of Musselburgh itself on the other.

In Wallyford and Whitecraig 85% of the houses are of recent construction. They are local authority houses of three or more rooms, laid out according to modern housing standards, and having a bathroom and proper sanitary accommodation for each house.

Housing in Musselburgh is in sharp contrast to Wallyford and Whitecraig. Musselburgh Town Council has its new housing schemes, but most of the houses in Musselburgh are still old. Some fall below accepted housing standards; many houses are of one or two rooms, and there are tenements which have no baths and in which the sanitary accommodation is shared. In addition to the unsatisfactory nature of the actual houses, parts of the town are congested and the houses are cramped together. The two districts have a common milk supply.

Of the children tested 2,442 were from the town of Musselburgh and 739 from Wallyford and Whitecraig. Of the town children 37.7% ± 0.98 were tuberculin-positive, and of the village children 27.9% ± 1.65. This is a significant difference (t = 5.2).

The results by year of age in the two areas separately are set out in Table VI.

TABLE VI.—*Comparison of Tuberculin-positive Rates in the Town of Musselburgh with Those in the Neighbouring Villages—by Year of Age*

Age	Town			Villages		
	No. Tested	Tub. Pos.		No. Tested	Tub. Pos.	
		No.	%		No.	%
5	248	70	28·2	68	13	19·1
6	298	81	27·2	67	15	22·4
7	221	62	28·1	71	14	19·4
8	226	68	30·1	72	12	16·7
9	219	81	37·0	84	22	26·2
10	258	94	36·4	77	20	26·0
11	226	91	40·3	57	16	28·1
12	254	128	50·4	87	33	37·9
13	190	91	47·9	55	27	49·1
14	218	113	51·8	87	28	32·2
15	84	43	51·2	14	6	42·9
Total	2,442	922	37·7	739	206	27·9

Relationship Between the Jelly Test and the Mantoux Test

The jelly test is simple to administer and was used as a screen before giving the 100 T.U. Mantoux test. The alternative would be to use a preliminary Mantoux test of 1 T.U. or 10 T.U. The advantage of the jelly test as the first test is that it is easier to secure the co-operation of both parents and children when no initial needle-prick is involved and where at most there will, for the complete test, be only one needle-prick.

Objections to the use of the jelly test have been made because its reliability was said to vary with the age of the child. It was thought that because younger children have clearer skins the test is easier to read in them than in older children who may have a tendency towards acne.

On the other hand, the test has sometimes been described as inconclusive in younger children because of a larger number of non-specific reactions. We feel that by reading the test on the fifth day this risk was reduced to a minimum.

Our experience with the test bears this out. Fig. 4 shows the percentage positive for each year of age divided into "jelly-positive" and "additional" positive discovered by the Mantoux 100 T.U. test. The parallelism between the two sets of readings is quite striking and shows no consistent variation with age.

Jelly-test Results in Musselburgh Compared with those in Wallyford and Whitecraig

In the M.R.C. survey of England and Wales the jelly test gave a higher proportion of the total positives in the rural children. This was attributed to repeated reinfection from milk.

In our survey area there is no difference between the milk supply of Musselburgh on the one hand and Wallyford and Whitecraig on the other, and there is no significant difference between the percentage of total positives detected by the jelly test in the two districts (83.2% ±1.2 in Musselburgh and 79.8% ±2.1 in Wallyford and Whitecraig).

Our experience where there is no difference in the milk supplies and no difference in the proportion detected by jelly would seem to be a reasonable corollary to the M.R.C. findings.

Tuberculin Testing of Schoolchildren as a Case-finding Measure

Of the positive reactors in the schoolchildren 95.8% were *x*-rayed by the mobile mass radiography unit visiting the schools. Six children were subsequently notified as having active pulmonary tuberculosis and three others remain under observation because of minimal radiological abnormalities. (Rate of confirmed cases 5.5 per 1,000.)

The contacts of the children with positive reactions were offered *x*-ray examination, and of those who came forward five were found to have abnormalities warranting notification. Six other cases have been placed under observation. Quite a number of other people availed themselves of the chance to be *x*-rayed while the units were in the district. Five other cases were notified from this group and six have been put on the observation list. Thus a total of 10 adult cases of tuberculosis were discovered among the contact group and the casual group, giving a rate of 2.5 cases per 1,000 *x*-rayed.

Discussion

As was hoped, the results in this survey provide an interesting comparison with recent surveys from England and Wales. It is fairly safe to make these comparisons because the tests used were similar. The accuracy and reliability of the tuberculin jelly test have recently been questioned, and we are well aware that it is by no means satisfactory in all respects. By adhering strictly to our criteria for reading a test as positive and by carrying out an intradermal test where any doubt existed, we feel that we have enhanced the validity of our results. Fig. 4 shows that the proportion at each age positive only to the intradermal test is constant at all ages, and this is additional evidence that our reading of the tests has been consistent. By reading the jelly test on the fifth day, we think that we have reduced the likelihood of false-positive readings, and our results are therefore at least as reliable as surveys in which this test was read at an earlier stage. It is now our view that the jelly test gives a sufficient number of doubtful readings to lead us to recommend that its use be avoided where the main purpose is scientific accuracy. On the other hand, for such purposes as the tuberculin-testing of young children where the acceptance rate might be adversely affected by the necessity for injection, we still feel that the jelly test has considerable advantages, especially when used by experienced observers. More recent experience suggests that a suitable compromise is available in the Heaf multipuncture test (Heaf, 1951).

Completeness and Lapses

It will be seen from Table I and Fig. 1 that a very high consent rate was obtained to the performance of the tests, and a very high proportion of the children completed them.

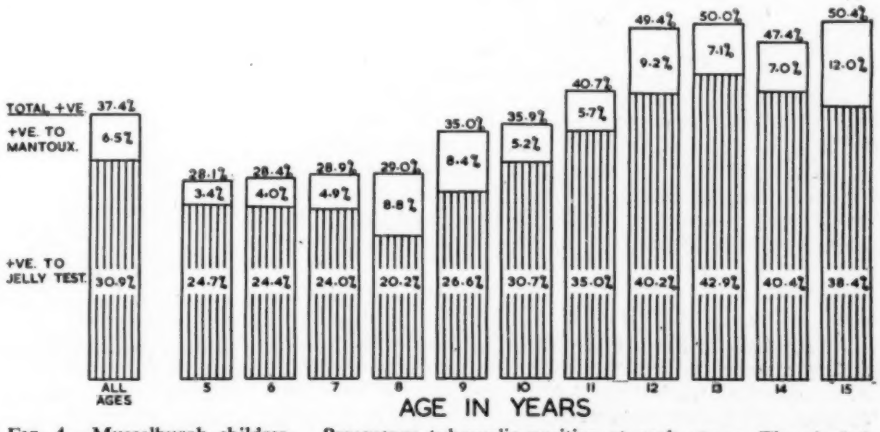

FIG. 4.—Musselburgh children. Percentage tuberculin-positive at each stage. The shaded area represents the percentage of children in that age group who were positive to the jelly test. The unshaded area represents the percentage negative to jelly test but positive to Mantoux test (1 mg. old tuberculin). The total percentage positive is given at top of each rectangle. The reasons given for excluding the 101 children who had had B.C.G. are not relevant to the subject matter of this chart. The percentages shown here are therefore calculated from the results of tests on all the children examined in each age group—a total for all age groups of 3,282.

This satisfactory response is ascribed to the harmonious co-operation of the public health staff and the hospital and clinic staff. In particular the availability of the facilities of the school health service gave us an instrument already geared for this type of work, and the cordial co-operation of the director of education, headmasters, schoolteachers, and school nurses did a great deal to secure the trust and co-operation of the parents. Other helpful influences were the support of the general practitioners, the town council, and local youth clubs. This survey demonstrates that practically complete acceptance of a public health or preventive measure can be carried out by the enthusiastic co-operation of all the interested authorities, when enlightened propaganda has paved the way. It is probable that this is one of the most important lessons to be drawn from the survey—that large surveys can be made acceptable to the general public by painstaking preparation and using only existing machinery and staff.

Comparison with Other Surveys

Several interesting points arise in the comparison of our results with other surveys. The average number positive at all ages (5 to 15) in Musselburgh was 35.5%, with no significant sex differences. The comparable figure for England and Wales was 27.7% (M.R.C., 1952).

The graphs giving the percentage of positives with increasing age show that in Musselburgh the graph starts at a singularly high level when compared with the National Tuberculin Survey, and yet it ends at the same level at age 15. Thus in Musselburgh 26.3% were positive at 5 years, and yet this only goes up to 50% at age 15 years, whereas in the Calder Valley the comparable figures are 19.7% and 67.7%. These figures suggest that children in the 5 to 8 age group in Musselburgh have been exposed in an unusual degree to tuberculous infection. Could this be a reflection on the post-war increase in respiratory tuberculosis in Scotland? It may be that the children who were tiny in the peak years 1945 to 1949 would be most affected by this phenomenon, since they were mainly the children of young adults on whom the brunt of the increase fell.

One interesting feature is the comparison between the positive rates at different ages in the areas we have designated urban and rural. There was a significantly lower level of positives at all ages in the rural population. We feel that milk supplies cannot be held responsible for this difference, because in both areas practically all milk comes from the same sources. It is conceivable that the main cause for this difference is to be found in the fact that almost all the families designated rural lived in relatively new houses. There is, however, no evidence that overcrowding was any less severe or less frequent in the rural families than in the urban, but there is no doubt that the building sites were much less overcrowded, giving the children more scope for playing-spaces. Also the newer houses were of a very much higher structural standard and much better from the point of view of sanitation, lighting, and ventilation. Likewise, none of the new buildings had common entries and none had shared sanitary facilities.

The fact that 50% of children of school-leaving age had negative reactions is support for the B.C.G. vaccination of this group, and it is satisfactory to note that such a scheme has since started.

Examination of Contacts of Tuberculin-Positive Schoolchildren as a Case-finding Measure

As regards the efficacy of this type of survey as a case-finding manœuvre, it is apparent from our figures that six cases of active tuberculosis were found among the schoolchildren. This was a valuable diagnostic procedure. Most of these cases would, however, have been detected by the school-leavers' B.C.G. campaign now in action, since they nearly all occurred in the older children.

It is, however, equally apparent that the examination of home contacts of children with positive reactions was not a very useful way of finding cases, since only five notifications resulted. It is advisable to remember that the amount of work expended on detecting these five cases was very considerable. It is indeed a fact that an equal number of cases came to light through *x*-ray examination of the general public, who came to the units simply because they had heard they were in the district. In this way five notifiable cases were detected. While we cannot claim that these five cases were diagnosed as a direct result of our survey, yet our propaganda undoubtedly had an effect in bringing them to the *x*-ray unit.

Summary

In Musselburgh 3,282 children between the ages of 5 and 15 years were tested for sensitivity to tuberculin. This figure represented 93.5% of the total school population. Consent had been obtained for the testing of 98.2% of all the children.

Of the youngest group 26.3% were positive, and of the 15 years age group 50% were positive.

Six cases of active pulmonary tuberculosis were found in the schoolchildren and five cases among the home contacts of the children with positive reactions. Thus examination of contacts of these children with positive reactions did not seem to be a very good case-finding measure.

We are greatly indebted to Dr. John Riddell, Medical Officer of Health for the County of Midlothian, for his co-operation and advice at every stage of this survey and for his permission to publish the material here presented. The Secretary of State for Scotland, on the recommendation of the Advisory Committee for Medical Research, made us a grant which we gratefully acknowledge. The grant covered the modest costs of the survey that are not covered by the normal Health Services—this included the employment of one extra female clerk. For the office work we would particularly like to thank Mr. B. Murray, Tuberculosis Clerk for the Midlothian Health Department, whose untiring energy did much to keep the clerical work abreast of the field work. To the Director of Education and his staff, the Nursing Supervisor and her staff, to general practitioners and clergy, members of the Town Council, and many members of the general public who helped in various ways our thanks are also due.

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In the latest annual review of the Rockefeller Foundation's programme, Mr. DEAN RUSK, the president, has this to say about the Congressional investigation of tax-exempt foundations last August. "If the Congress determines that it wishes a special Committee to look into tax exemption problems, our view is that we have an obligation to co-operate by furnishing the information desired. Unfortunately, that is not the end of the matter; the validity of the investigative process is affected by the sense of responsibility with which it is used. Repetitious investigation imposes unnecessary burdens upon those under scrutiny and adds little, if anything, to the information of the Congress. Investigations which are basically accusatory in character may, in the absence of great care, exceed the proper role of legislative investigation and infringe the established rights and privileges of those being investigated. Charges loosely framed or unsupported by facts offer no ascertainable issues on which to make reply and yet may damage reputable citizens and institutions. If fact-finding is distorted by partisan considerations, innocent bystanders are injured in the fray. If the same individuals act in both accusatory and adjudicative roles, injustice is the almost inevitable result. That the Congress itself is concerned about investigative procedures is a hopeful sign that common sense and the traditional concepts of government by law will be sustained."

VAGOTOMY WITH GASTRO-ENTEROSTOMY FOR DUODENAL ULCER

BY

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In the past few years there has been increasing agreement that a Billroth I partial gastrectomy alone is the most satisfactory surgical treatment for chronic gastric ulcer which is not associated with a duodenal ulcer or a high acid curve, and that this operation in a modified form can be used for ulcers very high up on the lesser curvature of the stomach. Only when the ulcer is high and posterior, adjacent to the oesophagus, is it necessary to use a transthoracic approach and perform an upper partial gastrectomy. For the more common case of duodenal ulcer, with its wider age incidence, which fails to respond to medical treatment there is much less agreement. Some surgeons—for example, Ogilvie (1953)—would not, in the absence of complications, advise an operation below the age of 40, but there are many cases in which a dangerous and incapacitating illness had started at least 20 years previously. It has been found impossible to be completely successful, by removing enough stomach to prevent further ulceration, without producing disturbances due to an insufficient organ. A subtotal gastrectomy cures duodenal ulcer, with only about 2% of proved recurrences, but about 10% of cases subsequently suffer from unpleasant symptoms and nutritional defects which at least make one hesitate to advise a high gastrectomy for young patients. There is much truth in Napoleon's saying that an army marches on its stomach.

Since 1948 one of us has submitted 269 cases of duodenal ulcer to vagotomy. It was quickly realized that if vagotomy was performed alone the result was usually unsatisfactory owing to gastric retention. Ulcer pain was relieved, but this was replaced by foul eructations, diarrhoea, and loss of weight. A barium-meal *x*-ray examination often showed a large 24-hour gastric residue even though the patients had no stenosis of the duodenum at the time of the vagotomy. The earlier a gastro-enterostomy is performed on these patients the better will be the permanent result. It was then decided to try vagotomy combined with posterior gastro-jejunostomy. Schindler (1937), from gastroscopic observations, found that a gastro-jejunostomy was more satisfactory if placed as near the pylorus as possible. It was considered even more important to drain the lowest part of the stomach when atonic following vagotomy. Incidentally, a low posterior gastro-jejunostomy is more easily converted to any form of partial gastrectomy than a high vertical one, should this prove necessary.

The vagotomy was always performed through the abdomen after mobilizing the left lobe of the liver. This latter procedure makes the operation easier, safer, and more certain. We also consider that Somervell clamps, which are non-crushing and yet non-slipping, contribute to the absence of complications in both gastro-jejunostomy and partial gastrectomy. Convalescence is usually uneventful: most of the patients can dispense with the Ryle tube in 48 hours. A post-operative chest complication was the commonest cause of a delay in recovery, but many of the patients suffered from chronic bronchitis. The operation is very safe; only one patient died in the post-operative period: a week after his operation he developed bronchopneumonia during the onset of a severe influenza epidemic. He died 48 hours later, and a post-mortem examination confirmed the diagnosis, but no cause for his death was found in the abdomen.

According to Johnson and Orr (1953), G. Crile, jun., and his colleagues have used this operation over 400 times, with a mortality less than ½%. His recurrence rate was 6%, but this was regarded as better than radical gastrectomy, with an operative mortality of 4% and a recurrence rate of 1%. Series of gastrectomies have been performed with a mortality under 2% (Tanner, 1954), but Johnson and Orr found a 4% mortality in a collected series of 3,000 post-war gastrectomies.

Illingworth (1953) has drawn attention to the comments of Jordan (1952) in her exhaustive report for the American Gastroenterological Association on the various surgical procedures. She compared the results of 842 cases of gastric resection with 633 cases of vagotomy plus gastro-jejunostomy (see Table):

Gastric Resection Compared with Vagotomy plus Gastro-jejunostomy

	Gastric Resection	Vagotomy + Gastro-jejunostomy
No. of cases	842	633
Primary mortality	3%	1·3%
Recurrent ulceration	1·7%	2·7%
Freedom from symptoms, return to work, and absence of post-operative haemorrhage	86·4%	78·8%

In this country, Pollock (1952) has reviewed 1,524 cases of vagotomy used alone and with other procedures. He found 12% of unsatisfactory results in a collected series of 511 cases of vagotomy combined with gastro-jejunostomy: 8% had recurrent ulcer pain, but in only 1% was there a proved recurrence. The follow-up, however, was for more than three years in only 7%. Hand and Patey (1953) have been disappointed in their results of vagotomy, but they combined it with gastro-jejunostomy in only eight cases, with one relapse. They combined vagotomy with hemi-gastrectomy in 17 cases and no recurrence of ulceration has occurred so far.

Late Results

Tanner (1954) has stated that no definite conclusions can be drawn from anything less than a five-year follow-up for an operation performed for peptic ulcer. We agree with that policy, but it becomes progressively more difficult to trace old patients, and an increasing number will die of unrelated diseases. We therefore decided to examine and fill in a questionary for all those patients who had been operated on between six and four years previously. Ninety-five patients were in this category, and with persistence it has been possible to follow up all of them.

Five male patients had died in the intervening years. The deaths were due to carcinoma of the bronchus, coronary thrombosis, influenza, and intestinal obstruction with a lung abscess due to peritonitis from appendicitis in earlier life. These four patients were apparently cured of their duodenal ulcer, which gave no further symptoms; three of them died in hospital, and a post-mortem examination revealed no active ulcer. The fifth non-survivor was an early case: a man aged 67, who had a gastro-jejunostomy 10 months after his vagotomy, at first progressed favourably, with gain in weight. Later he developed pain in the left iliac fossa, with radiological evidence of extensive

diverticulitis. A rapidly progressive psychosis caused his death in a mental hospital. There was never any definite evidence that this man's later abdominal symptoms were due to his duodenal ulcer or to the surgical treatment. It has, however, been found by others that, if the "drainage" operation on the stomach is not performed at the time of the vagotomy, symptoms presumably due to gastritis are more likely to occur.

Seven of the 95 patients developed symptoms of recurrent ulceration—six had recurrent pain, while one developed melaena; all these were submitted to a further operation. It is noteworthy that in two of these cases, both early ones, the operation notes stated that the vagotomy was probably incomplete. An insulin test meal confirmed the incompleteness of the vagotomy. A further four patients had slight attacks of pain, probably due to recurrent ulceration. One of these had a small haematemesis, so there was no doubt about the presence of at least a temporary ulcer in this case.

We are very pleased with the result in the remaining 79 cases with no history of recurrent ulceration. Some of them, especially the older ones, have other diseases, with chronic bronchitis heading the list, which are not directly related to the duodenal ulcer. The majority have no symptoms whatsoever, and all display no nutritional defect. It is usual for the patient to retain his or her occupation, or even to obtain a better and more strenuous one, without losing weight. One young man has resumed playing Rugby football, which is not usual after a high partial gastrectomy. Serious diarrhoea was seen only after vagotomy without a "drainage" operation. Constipation is common among patients with duodenal ulcer who are chosen for operation chiefly because they are eating so little: a return to a normal daily evacuation was the most common post-operative result. It has already been recorded that an afferent-loop syndrome is rare after this operation compared with a high Polya partial gastrectomy (Wells and MacPhee, 1952). It was more likely to occur if vagotomy was performed on a patient who already had a high rather than a low gastro-jejunostomy.

Secondary Operations on the 4- to 6-year-old Cases

It is appropriate here to discuss the fate of the 7 patients of the 95 who were submitted to further operative procedures for recurrent symptoms. The two cases in which the vagotomy was incomplete were submitted to a Polya partial gastrectomy. The result was excellent in one patient and fairly good in the other, who has some dumping and occasional vomiting. Removal of the pyloric antrum below the stoma, with closure of the duodenum, was performed in four cases, with a satisfactory result in two. The two failures were both in women, who complained of symptoms suggesting an afferent-loop syndrome. A Billroth I conversion of both of these unsuccessful pylorectomies has resulted in cure of one, but it failed to relieve the other of attacks of pain and vomiting. With these symptoms she still looks well and has not lost weight. In spite of cancer-phobia and an unsuccessful second marriage, it is thought that her symptoms are genuine. Professor Wells has recently converted her gastrectomy to the Roux-en-Y type, so we await the final result with interest.

Findings at the Secondary Operations

So far as we know, no case of perforated ulcer has occurred in the 240 cases after the operation of vagotomy and gastro-jejunostomy. Out of this total, 17 patients have undergone a secondary operation with no mortality. No jejunal ulcer was seen and a stomal ulcer was found in only two cases. One of these followed incomplete vagotomy performed on a patient who had already had an operation for a perforated duodenal ulcer, and a subsequent posterior and an anterior gastro-jejunostomy performed by various surgeons. A partial gastrectomy had been contemplated on two of these occasions, but the extensive peritoneal adhesions dating from the perforation had caused each surgeon to retreat from his original plan. After partial gastrectomy, finally performed with great difficulty, and a convalescence marred by jaundice due to incompatible blood transfusion, the patient made a good recovery. He has now been working at the coalface for some years, with no dyspepsia.

In those cases with symptoms—for example, haematemesis—suggestive or conclusive of recurrent ulcer the original duodenal ulcer appeared to be the cause, but at the second operation the oedema and crater had always disappeared; in fact, the ulcer seemed to be healed. A recurrent gastric ulcer has been found on only one occasion. This patient, a young woman, had already had two perforated duodenal ulcer closures when submitted to vagotomy and gastro-jejunostomy. A Billroth I partial gastrectomy has now apparently cured her. It is interesting that a fractional test meal examination just before her third operation showed a low acid curve, so it is possible that her gastric ulcer either was missed at this time or was too small to feel.

Type of Secondary Operation

Nine of the earlier failures of vagotomy with gastro-jejunostomy were submitted to either pylorectomy or a Polya partial gastrectomy, just over half the stomach being removed if there was evidence that the vagotomy was incomplete. Two of these cases, already mentioned, have been converted to Billroth I anastomoses. In addition eight further cases have been converted to a Billroth I partial gastrectomy, all with an excellent result. This means that there has been only one failure out of 15 secondary cases, and even this case might be finally cured.

A peritoneal adhesion occluding the efferent loop of the gastro-jejunostomy once made it necessary to reopen the abdomen 10 days later: no further trouble occurred in this case.

Jaundice due to a large duodenal ulcer is rare. Three such cases have been encountered, requiring in addition cholecystenterostomy: two of these have been successful, one for six years, but the third later developed fatal ascending cholangitis due to stenosis of the biliary anastomosis.

Discussion

Vagotomy, including attempted vagotomy, combined with a low gastro-jejunostomy, has given a very satisfactory result for duodenal ulcer, lasting between four and six years in 88%. The operation is very safe and has not caused any reactivation of phthisis in four patients with major quiescent lung lesions. A secondary operation was required in 7.4%, and a Billroth I conversion has been found to be the most satisfactory way to relieve the failures, which are not all due to recurrent ulceration. In view of the further 5% of patients with slight symptoms who must be regarded as unstable, and the success obtained with a Billroth I conversion, it was obvious that we should try vagotomy combined with a Billroth I resection as a primary operation wherever possible. This has now been done in 30 cases. At first only those with a wide duodenum were regarded as suitable. The operation is now considered possible in all cases (Schmitz *et al.*, 1954) by splitting the anterior wall of the duodenum. There has been no mortality so far, but we feel that in poor-risk patients, especially if there is a large oedematous ulcer, it may still be wiser to perform vagotomy with gastro-jejunostomy, which allows a Billroth I resection later if necessary, when the duodenum will take more kindly to sutures.

The immediate post-operative recovery has been satisfactory apart from two cases which had excessive intragastric bleeding. One of them had to be reopened 10 hours later, when a bleeding artery was found near the lesser curvature of the stomach. The whole anastomosis was resutured and the patient made a good recovery. The early results after leaving hospital, including gain in weight, appear satisfactory, but a few years must elapse before they can be truly assessed. Wells and MacPhee (1954) and R. Welbourn (1954, personal communication), by different

routes, have come to the same conclusion—that vagotomy and Billroth I resection should be tried further. Vagotomy and limited partial gastrectomy has been very successful in the hands of Johnson and Orr (1953).

Summary

For duodenal ulcer, excluding cases of acute bleeding but including a few perforated cases which required more than simple closure, the operation of abdominal vagotomy combined with a low gastro-jejunostomy is a very safe procedure and appears to produce good results lasting four to six years in 88%.

The failures (7%) were submitted to a further operation without mortality: all except one case have been relieved.

A Billroth I conversion was the most satisfactory secondary procedure; also, vagotomy combined with a Billroth I partial gastrectomy may prove to be the best primary procedure.

Vagotomy should be included in the treatment of duodenal ulcer because only 50% of permanent good results can be expected from gastro-enterostomy alone.

We now regard vagotomy combined with gastro-jejunostomy to be at least the best second-choice operation.

Most of the follow-up work was done by S. O'D., but we are indebted to Mr. Harral Thompson for following up the cases at the Royal Southern Hospital during his tenure of the post of surgical registrar

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EFFECTS OF DORSO-LUMBAR SYMPATHECTOMY ON PEPTIC ULCERATION

BY

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Extensive dorso-lumbar ganglionectomy and splanchnicectomy as carried out from the treatment of hypertension interrupts the sympathetic nerve supply to the stomach (Bingham *et al.*, 1950); by masking symptoms it may have a harmful effect on the course of peptic ulcer. Frequently it is only by complications such as pyloric obstruction, perforation, or haemorrhage that the ulcer announces its presence. The following case illustrates these features.

Case Report

A male shipping clerk aged 38 was admitted in April, 1949, suffering from angina of effort. This had started six months previously, when he had breathlessness and pain down the inner side of the left arm on exertion; a week later the pain became substernal and compelled him to stop when walking. During the six weeks before admission pain had come on at rest and had lasted about five minutes. He gave a previous history of an appendicectomy for vague dyspeptic symptoms in 1930; the operation had given him relief, but at intervals he had continued to have mild epigastric discomfort. There was no history of nephritis or other renal lesion. The family history was indefinite; his mother had died in childbirth and his father died suddenly at age 40, cause unknown.

He was a moderately well nourished man whose blood pressure remained between 230/130 and 220/130 during his stay in the medical ward. The fundi showed early vascular changes but no haemorrhages, exudates, or papilloedema. Clinical examination of the heart, lungs, abdomen, and central nervous system was negative and there was no albuminuria. A cardiogram taken in March, when he was an outpatient, had shown evidence of ischaemia in the shape of terminal inversion of the T waves in lead V_4; but on admission the cardiogram at rest was normal. Radiologically the heart shadow was normal and the lung fields were clear. Intravenous pyelography showed normal concentration and excretion of the dye, and no abnormality was demonstrated in either kidney. Urea clearance was 74%, maximum urea concentration 2.3 g. per 100 ml., and blood urea 36 mg. per 100 ml.

In May, 1949, a left dorso-lumbar ganglionectomy and splanchnicectomy was performed by the transpleural route, the ganglia from D 6 to L 1 being removed. After this he had complete relief from angina of effort. His blood pressure remained in the region of 155/110 until the beginning of October, when it began to rise again. During this period, however, he complained of vague epigastric discomfort and distension with occasional slight nausea.

He was readmitted in November, 1949, with a blood pressure of 198/118, and a right dorso-lumbar ganglionectomy and splanchnicectomy was performed, the ganglia from D 6 to L 1 being removed. After this operation he remained completely free from angina, and his own doctor never found his systolic blood pressure higher than 180. However, he began to have attacks of epigastric distension and vomiting. At first these attacks occurred at intervals of several months, but later the intervals shortened to two or three weeks. During the attacks vomiting was profuse and continued at 24 hours or more until the stomach was completely emptied; food taken the previous day was sometimes recognized. His appetite failed, he lost weight, and he experienced increasing constipation. Pain was absent throughout. He was seen in consultation on July 25, 1951, when a diagnosis of pyloric stenosis was made; at that time his blood pressure was ranging between 160/100 and 140/90. A barium-meal examination showed a large resting content in the stomach and a marked degree of pyloric stenosis, which was not lessened after treatment with atropine. He was admitted once more in August, and laparotomy was performed in September. There was a large active chronic ulcer of the anterior duodenal wall, covered by omental adhesions; the stomach was dilated and its muscular wall was much hypertrophied. A posterior (no-loop antiperistaltic) gastro-jejunostomy was performed.

He remained well for eight months, then began to have a sense of fullness after meals with anorexia but no pain. On August 24, 1952, he was wakened with sudden severe pain radiating over the whole abdomen and accompanied by tenderness and rigidity. A laparotomy was carried out (Mr. J. Hinton Robertson); after evacuation of a considerable quantity of gas and fluid, a perforated jejunal ulcer was located diametrically opposite the stoma of the gastro-jejunostomy. This was closed by suture. During convalescence a fractional test meal showed total acidity of 48 units and free HCl 22 units. Two months later the gastro-jejunostomy was undone and a partial gastrectomy was

carried out, four-fifths of the stomach being removed; continuity was restored by an anterior Polya with Hofmeister valve anastomosis.

When last seen (November 15, 1954) he was working again and doing more than he had been able to do for many years, but had given up sport. He has remained completely free from angina of effort, despite the fact that his blood pressure has returned to the pre-operative level; recent readings have been 220/130 (October 30, 1953); 200/110 (September 3, 1954); 240/134 lying, 220/130 standing (November 15, 1954). Changes in the retinal arterioles have advanced, but the heart shadow remains normal radiologically, and the cardiogram was still physiological. During the past year he has from time to time had pain in the left upper abdomen, sometimes three hours after food, sometimes wakening him at night. A barium-meal examination showed normal progress from the remaining portion of the stomach to the jejunum, and no evidence of ulcer was seen: progress through the small bowel was accelerated.

Discussion

Painful sensations arising in the abdominal viscera are transmitted by afferent fibres which accompany the sympathetic nerves and pass uninterruptedly through the sympathetic ganglia to enter the spinal cord by the posterior nerve roots. Dorso-lumbar ganglionectomy will abolish those forms of abdominal visceral pain which are normally transmitted through the sympathetic. When perforation occurs structures supplied by other afferents are involved, including the parietal peritoneum; pain from here reaches the spinal cord by way of the peripheral nerves and is not abolished by dorso-lumbar ganglionectomy.

Frœhlich *et al.* (1942) reported four cases in which sympathectomy was performed as treatment for gastric ulcer. In all of them the distress was relieved and the ulcer craters showed radiographic evidence of healing. Sicard *et al.* (1945) carried out splanchnicectomy in eight cases of gastro-duodenal ulcer. Although there was some relief of ulcer pain, cure was not complete. Five required gastric resection within 18 months.

Harkins and Willard (1950) speak of the relief of pain as "a Pyrrhic victory" in reporting a case of peptic ulcer in which sympathectomy had adverse effects. Weeks *et al.* (1946) describe the case of a man with duodenal ulcer and malignant hypertension. A transthoracic vagotomy was performed and at the same time the left thoracic-lumbar sympathetic chain was removed from D 5 and L 2. Two weeks later the second-stage sympathectomy was carried out on the right side from D 5 and L 2, after which the patient became extremely ill and died on the 15th post-operative day. Necropsy revealed a perforated duodenal ulcer with general peritonitis. An interesting feature was the absence of abdominal pain in the presence of a perforated ulcer and peritonitis. The authors state: "His absence of pain may have been due to the removal of the viscero-sensory fibres associated with the sympathetic side of the autonomic nervous system." Blegen and Kintner (1947) describe a case with gastric ulcer which had three massive haemorrhages following extensive unilateral sympathectomy, and point out that the sympathectomy relieved the pain but the ulcer progressed.

Mason and Pollard (1949) found 13 instances of peptic ulcer in a group of 1,498 patients who underwent splanchnicectomy for hypertension during an 11-year period. They point out that frequent and severe complications developed in 12 because the normal epigastric pain sensation was either abolished or greatly reduced so that ulcers were permitted to advance without giving the usual warning.

The present case illustrates progression of a duodenal ulcer and development of pyloric stenosis after bilateral dorso-lumbar ganglionectomy and splanchnicectomy carried out for hypertension; a jejunal ulcer subsequently developed and later perforated. Pain was conspicuous by its absence while the original ulcer was progressing and while the jejunal ulcer was developing, but severe pain occurred when the latter perforated. After dorso-lumbar ganglionectomy and splanchnicectomy the pain which characterizes exacerbations of a peptic ulcer is abolished; it is therefore suggested that in such cases more attention should be paid to vague abdominal symptoms which may take the form merely of slight epigastric discomfort or fullness.

It is well known that the lowering of blood pressure which results from sympathectomy has often been transient. Hypertension has recurred within 5 to 10 years in a high percentage of cases (Smithwick, 1948). In the present instance hypertension was abolished for three years but had returned by the end of the fifth year. The mechanism underlying recurrence of hypertension after sympathectomy is not fully understood. During the fifth year abdominal visceral pain returned; but it may well have arisen in the colon. The sympathetic nerve supply from the colon was not interrupted by the original operations.

Summary

A case is presented showing the progression of a duodenal ulcer following bilateral dorso-lumbar sympathectomy and splanchnicectomy, the subsequent development of a jejunal ulcer, and its ultimate perforation. The effect of sympathectomy on the pain of peptic ulcer is described and its mechanism is discussed.

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MALARIA AND THE SICKLING TRAIT

BY

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This paper reports confirmation of Allison's (1954) conclusion that the possession of the sickling trait confers some protection against *P. falciparum* malaria, but it presents somewhat different views on the nature and extent of this protection.

Of the two experiments performed by Allison, one determined the parasite rates in children under 5 years of age in the Kampala region, mostly (Allison, personal communication) in the out-patient department of Mulago Hospital. Forty-three sickling children showed a parasite rate of 27.9%, and 247 non-sicklers a rate of 45.7%. This difference seemed so striking that it was reasonable to wonder why it had not already been noticed, or whether some feature of the experiment had accentuated a difference that was real, but actually of lesser magnitude. Indeed, since *P. falciparum* clearly can establish itself in the peripheral blood of sicklers, and can even multiply in the erythrocytes of cases of sickle-cell anaemia (in which there is no normal adult haemoglobin), it seemed reasonable to suppose that the effect of the presence of sickle-cell haemoglobin could not be to prevent an infection, though it might well limit the extent to which an infection could develop. If this were confirmed, quite sufficient explanation would have been given of the way in which *P. falciparum* infection could act as a selective agent in preserving high sickle-cell gene frequencies in endemic malarial regions, because it is

well known (Field, 1949) that the mortality from falciparum malaria is related to the height of the parasite count. But in that case some explanation would have to be found for the apparent difference in parasite rates observed by Allison in sicklers and non-sicklers respectively. And, since the results of Allison's inoculation experiments do not fully accord with the view advanced above, this view would have to be reconsidered if confirmation of his results should be obtained. This last question is not considered further here.

It was decided to repeat Allison's first experiment on the same type of patient, with the addition that parasite counts should be performed on all falciparum infections encountered, and to continue certain other observations that were already in progress.

Malaria Infection in Relation to Sickling

Three groups formed the basis for this study—two of children and one of adult women.

Group I

The subjects examined were 1,200 children under the age of 10 years presenting for any reason (very often "fever") at the medical out-patient department of Mulago Hospital, Kampala. They were taken without selection during a two- to three-hour visit by a native laboratory assistant, who recorded their personal details, and collected from each a thick and a thin blood film and a few drops of blood in saline. All the specimens were examined by me. Sickling was tested for in a 24-hour culture of *Bact. coli* and read at two to four hours, and paper electrophoresis was performed if necessary. Malarial species diagnosis was made on thick blood films, but the thin films were used if any doubt existed.

Malaria was detected in 638 of the children—90 times in 191 sicklers (47.1%), and 548 times in 1,009 non-sicklers (54.3%). For this difference in favour of sicklers, $\chi^2 = 2.65$, $n = 1$, $0.2 > P > 0.1$, and thus the possibility that the difference had arisen by chance was rather high. But this does not take account of the species of parasite present. If we exclude the *P. ovale* infections (7 in number), and 11 cases in which the species could not be determined with accuracy (there were no *P. vivax* infections), and consider only infections with *P. falciparum* and *P. malariae*, a different picture emerges. In compiling Table I, cases in which these two species were present together have been counted as separate infections (in 36 children). In the whole 1,200 children there was no indication that the incidence of *P. malariae* was affected by the sickling state of its hosts, but the numbers showing this parasite were not great. *P. falciparum*, however, was very noticeably commoner in non-sicklers, except in the first year of life. It will be noticed that the apparent protection against all forms of malaria, and even against *P. falciparum*, is much less in this series than in Allison's (1954). It may be added that the two main tribal groups covered by this survey had closely similar sickle-cell frequencies; the largely rural Baganda showed a higher malaria rate than the urban and suburban Nilotics, but the apparent protection against *P. falciparum* was present in each to a significant degree.

TABLE I.—*Incidence of P. malariae and P. falciparum Infections in Sicklers and Non-sicklers, Among 1,200 Children under 10 years of Age at a Medical Out-patient Department*

Age in Years	Sickling State	No. of Cases	*P. malariae*		*P. falciparum*		
			No.	%	No.	%	χ^2 (n=1)
Under 1	Positive	68	7	10·3	32	47	1·15 (P>0·2)
	Negative	325	15	4·6	130	40	
1–	Positive	59	6	10·2	20	34·4	10·13 (P<0·01)
	Negative	288	21	7·3	163	71·5	
2–10	Positive	64	3	4·7	21	32·8	7·11 (P<0·01)
	Negative	396	37	9·3	201	50·8	
Total	Positive	191	16	8·4	73	38·2	7·4 (P<0·01)
	Negative	1,009	73	7·3	494	49·3	

Group II

Long before the above investigation was started, however, data were being collected from another group. These were children under the age of 5 years, attending child welfare clinics in and around Kampala, under the care of Dr. H. F. Welbourn, to whom I am indebted for permission to quote the following facts. At these clinics the children attend as families for general supervision, and not primarily because they are ill, though illness may often determine the first attendance of a family. A laboratory assistant attended all the clinics, and specimens were brought to the laboratory and examined in the same way as for the hospital series. Sickling and malaria were tested for on the first attendance of each child, and the results given below refer only to the first attendances, or to the first occasion when the tests were performed—in any case, before any antimalarial treatment had been given. Malarial species diagnosis was not quite so certain as in Group I, and the figures quoted here are for all species, though of course *P. falciparum* predominated

From April, 1952, to October, 1954, 1,194 children were tested on first attendance; of 192 sicklers, 58 (30%) showed malarial parasitaemia, while of 1,002 non-sicklers 334 (33.4%) did so—a difference that is quite insignificant, but of the same nature as that for gross malarial parasitaemia in Group I. Among these children the malaria rate was lower, and the proportion of Nilotics higher, than in the hospital series, but again the two main tribal groups gave closely similar results. The apparent protection against malaria in the sicklers was less in this group than in Group I, and a possible reason for this is suggested below.

Group III

One other group of persons was examined in the same way as the preceding; this was a consecutive series of 663 mothers of some of the children in Group I. They were not ill, and they were selected only in the sense that they had brought their sick children to hospital. Practically all would possess a considerable acquired immunity to the effects of malaria. All the 91 infections detected in them were of mild degree (only 5 showed more than about 1,000 parasites per c.mm.), and all were considered to be of *P. falciparum*, though proof was not always absolute when the parasites were very scanty. In the 135 mothers who were carriers of the sickle-cell trait there were 24 (18%) who showed parasites in the blood; in the 528 non-sicklers there were 67 (12.7%). These findings are the reverse of those for the children in Group I, but the difference is of about the same order of magnitude, and might with equal likelihood have arisen by chance ($\chi^2 = 2.35$, $n = 1$, $0.2 > P > 0.1$).

Parasite Count in Relation to Sickling

The following findings refer only to the *P. falciparum* infections encountered in Group I and to the counts determined, for each child, only on the day on which it first attended hospital. Parasite counts were performed on 558 consecutive falciparum infections (they were omitted in the first nine cases). Counts were made against leucocytes in parts of the field where the distribution was even, and the result was recorded on the assumption that the leucocyte count was 5,000 per c.mm. Noticeable leucocytosis was very rare in malarial children.

Table II shows that more than half the falciparum infections in the sickling children were of low intensity, while non-sickling children showed predominantly heavy infections. It may be added that the highest count found in a sickler was 160,000 per c.mm., whereas counts up to 800,000 per c.mm. were not unusual in non-sicklers. For this analysis, grouping by parasite density has been made on a logarithmic basis (in powers of 10) for convenience, and because this accords with the process of multiplication of an

TABLE II.—*Distribution of Parasite Densities in 558 Consecutive Infections with P. falciparum in Children under 10 years, in Sicklers and Non-sicklers*

Parasite Count per c.mm.	Sicklers (72 Cases)		Non-sicklers (486 Cases)	
	No.	% of Total	No.	% of Total
Under 100	20	27·8	55	11·3
100–	17	23·5	57	11·7
1,000–	14	19·5	147	30·2
10,000–	18	25·0	182	37·4
100,000+	3	4·2	45	9·4

TABLE III.—*Comparison of the Incidence of Parasite Counts under 1,000 per c.mm. in Sicklers and Non-sicklers at Various Ages, in 558 Children Infected with P. falciparum*

Age in Years	Sickling State	No. of Cases	Cases with Counts under 1,000 c.mm.		
			No.	%	χ^2 (n = 1)
Under 1	Positive	30	16	53·3	11·99 (P < 0·01)
	Negative	132	29	29·5	
1–	Positive	20	12	60·0	14·5 (P < 0·01)
	Negative	162	34	20·9	
2–10	Positive	22	9	40·9	2·36 (0·2 > P > 0·1)
	Negative	192	49	25·5	
Total	Positive	72	37	51·4	21·94 (P < 0·01)
	Negative	486	112	23·04	

organism. In this arbitrary scale a figure of 1,000 per c.mm. represents a point in the Table about which the difference between sicklers and non-sicklers is most pronounced, and Table III shows how a grouping of cases into those with counts of less than 1,000 per c.mm. and those with over 1,000 reveals a striking difference between sicklers and non-sicklers at all ages—least amongst the older children, but remarkable even in those under 1 year, in whom (Table I) falciparum infections were commoner in sicklers. Again, it may be added that these differences were as marked for the Baganda as for the Nilotic children.

Nature of the "Protection" Enjoyed by Sicklers

The view put forward here is that the presence of sickle-cell haemoglobin in a person's erythrocytes does not prevent his infection with plasmodia, but does limit the extent to which at least a falciparum infection may develop. This probably means also that attacks of falciparum malaria will be on the whole briefer and less disabling among sicklers, and that, in them, dangerous attacks will be rare. This view is derived from the observations of parasite counts in a certain group of children, and therefore the validity of this experiment must be discussed.

The present experiment was not designed to detect the highest extent to which parasitaemia could develop in sicklers and non-sicklers respectively, nor was it possible to record the duration of each attack at the time the examination was made—and very marked changes are to be expected in the count as an attack develops and recedes. In this locality a visit to hospital is likely to be considered for some time before it is decided upon, and thus low counts are extremely unlikely to represent attendance early in an attack of malaria; they represent either the possession of immunity or attendance towards the end of an attack. Significant immunity can be excluded in practically all these children. If, therefore, we are to draw conclusions from the greater frequency of low parasite counts in sickling children, we must be assured that they attended, on the average, at about the same stage of the attack as did the non-sicklers; or if they attended at a somewhat later stage of their attacks than the non-sicklers did we must find an explanation for this. In spite of the lack of clinical data, there is some evidence on this point.

Three features were encountered rather more often in the blood films of sicklers than in the rest—signs of erythropoietic activity (Raper, 1954a), well-grown trophozoites, and gametocytes. The latter were found in 31% of falciparum infections in sicklers, and in 21% of these infections in non-sicklers. None of these features can be ascribed directly to sicklaemia, but they are all indications of the early recovery phase of malaria. The experiment, therefore, had admitted a slight excess of sicklers in the early stages of recovery from malaria, and the reason for this must be sought. In this area, sicklers are not more common in the more remote population than in that close to the hospital, nor in the lower social classes than in the higher; indeed, they are less common in the more primitive tribes included in this experiment. Thus social and educational factors, producing different attitudes to the use of a hospital, are unlikely to have determined the later attendance of sicklers. The only explanation likely to account for all the observed facts is that falciparum attacks in sicklers are unusually mild and brief. This is the hypothesis advanced here; the low counts observed in sicklers are a feature of the kind of malarial attacks they experience, and, though the present results may slightly exaggerate this feature, they could not have been produced unless it existed.

The establishment of this point makes it possible to offer an explanation for the inconclusive reports regarding gross parasite rates in sicklers and non-sicklers, both among those recorded here and among those of Beet (1946, 1947), Brain (1952), Edington (1954), and Moore *et al.* (1954). All but the last of these referred to hospital patients, most included adults as well as children, and none except the last distinguished between the species of parasite. Among such non-immunes as were included, the sicklers would attend hospital less often because of their milder attacks, and so would form a smaller proportion of all malaria cases diagnosed, thus accounting for the general tendency to record fewer malarial attacks among sicklers. There must have been less selection of this sort in the child welfare clinic children recorded here (Group II), and in them the apparent protection against all forms of malaria was somewhat less than in the hospital series (Group I). Where no selection whatever is employed, as in the field survey of Moore *et al.* (1954), a very small difference between the two groups could be expected to arise from the probability that sampling at any moment would detect slightly fewer infections in sicklers, simply because their attacks are rather briefer than in non-sicklers. But the number to be sampled before this difference appeared significant would be very great, certainly several times 2,394, which is the number of partially selected cases recorded here.

In this connexion it may be remarked that since attacks of quartan malaria are normally of long duration, and on the whole mild, the results recorded here for *P. malariae* are quite inadequate in number to decide whether sicklers do or do not enjoy any protection against this species.

If the subjects of a survey possess any other means of resisting the growth of plasmodia, this must affect the degree of protection they exhibit from possessing or lacking the sickle-cell trait. In a region of heavy malarial endemicity adults possess this protection by reason of their acquired immunity (or "premunition"). How far this operates in sicklers and non-sicklers respectively is not revealed by the results quoted above for the 663 mothers (Group III), because they were neither selected by illness nor distinguished by the degree of their parasitaemia. But all experience suggests that acquired immunity is at least as potent a protection as the possession of the sickling trait. Hence the inclusion of adults in a survey in an endemic malarial region will obscure any protection that the sicklaemic children may enjoy.

It has been mentioned above that the relative protection of sicklaemic children against *heavy* falciparum infections is enough to account for that increased chance of survival that is required to explain the persistence, or the building up, of high frequencies of the sickling gene in parts of Africa. I have emphasized elsewhere (Raper, 1954b) that the process is a dynamic one, and that the present situation in that continent need not be treated as static. Field (1949) saw very few deaths from falciparum malaria in Malaya in persons whose parasite counts were under 10,000 per c.mm., and no death with a parasite count of fewer than 2,300 per c.mm.

It has been remarked above that the difference between sickling and non-sickling children is particularly marked at about this level of parasitaemia. It is important to notice that for natural selection to operate in favour of heterozygous sicklers it must exert its effect before reproductive age; the view advanced here is that it can operate only in the absence of acquired immunity, and in an endemic area it is precisely those below reproductive age who lack effective immunity.

All this evidence is of course indirect; the decisive information—accurate mortality statistics for sicklers and non-sicklers before puberty—is nowhere available, and will be difficult to collect. Nevertheless, there is enough evidence to give support to Allison's (1954) hypothesis, and to justify attempts to show exactly how the metabolism of the various species of plasmodia is affected by the molecular structure of the haemoglobin in the erythrocytes that they invade.

Summary

In two large series of children living in the vicinity of Kampala, Uganda, the gross malarial parasite rate was found to be lower in those carrying the sickle-cell trait than in others, but not significantly so.

In a series of 1,200 children attending hospital the *P. falciparum* rate was significantly lower in sicklers than in non-sicklers.

Parasite counts in *P. falciparum* infections were very much lower in sickling than in non-sickling children.

It is maintained that the presence of sickle-cell haemoglobin in erythrocytes does not prevent, but limits, the severity of *P. falciparum* infections in non-immune subjects. Insufficient data are available to assess the effect of sickle-cell haemoglobin on other species of plasmodia.

I am indebted to the medical superintendent and physicians of Mulago Hospital and to Dr. H. F. Welbourn for access to cases under their care, and to the D.M.S. Uganda for permission to publish.

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Television has been used by the American Medical Association since 1946 for health education, either in broadcasts to the public or on closed circuit to the medical profession, and the A.M.A. has recently published a handbook, *Television in Medical Education*, to give doctors guidance on the techniques of successful televising. The first part is devoted to the workings of television, which are clearly explained with the aid of photographs and diagrams. The second part gives practical help in producing a medical programme, suggesting ways in which information can be given, such as by monologue, interview, or documentary. Two scripts are reproduced, one for a public and one for a specialist audience. The reader is reminded that television is a visual medium, and he is shown how to include graphic and visual devices such as charts and sectional cut-outs in his programmes. Advice on dress, voice production, and approach is also given. The last section of the handbook describes what has already been achieved by this medium in medical education, and ends with a glossary of television terms. While, as the foreword points out, "learning by active participation has no peer," this publication is intended to enable doctors to make television a useful adjunct to their teaching programmes.

EFFECT OF SICKLE-CELL TRAIT ON RESISTANCE TO MALARIA*

BY

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Type S (sickle) haemoglobin is present in the red cells of a sizable percentage of members of the negro race. The presence or absence of this abnormal haemoglobin type is genetically determined. Heterozygous individuals, whose red cells also contain type A (normal) haemoglobin, suffer no ill effects from the presence of the abnormal haemoglobin, although sickling of the cells may be demonstrated when the oxygen tension is greatly reduced. Such individuals are said to have the sickle-cell trait. When, on the other hand, type S haemoglobin is inherited in the homozygous form, sickle-cell disease, a severe chronic haemolytic anaemia, results (Pauling *et al.*, 1949; Neel, 1951). Thus, unless individuals with the sickle-cell trait possessed some selective advantage, the gene for sickle haemoglobin would gradually be eliminated from the population by the early death of those with sickle-cell disease.

Allison (1954) has suggested that an increased resistance to infection with malaria may be such an advantage. He reviewed evidence that the incidence of malaria in endemic areas was lower in those individuals with the sickle-cell trait than in those without the trait. He also noted that the incidence of the sickle-cell trait was highest in those areas in which malaria was prevalent. Upon inoculation of a series of highly immune subjects with an African or a Malayan strain of *P. falciparum* intravenously and, in some cases, also with infected mosquitoes, Allison found that only 2 out of 15 "sicklers" (sickle-cell trait) developed malaria, while 14 out of 15 "non-sicklers" developed malaria. In the present study we have attempted to evaluate the effect of sickle haemoglobin on resistance to malaria under carefully controlled conditions.

Materials and Methods

All subjects were inmate volunteers from the Stateville Branch of the Illinois State Penitentiary at Joliet, Illinois. Sixteen American negroes who had never previously had malaria were inoculated. Erythrocytes were examined for sickling by the 2% sodium metabisulphite method (Daland and Castle, 1948). In addition, haemoglobin from each volunteer was examined by filter-paper electrophoresis. Each of the eight "sicklers" had both type A and type S haemoglobin; each of the eight "non-sicklers" had only type A haemoglobin. In each of the three studies all subjects were inoculated with aliquots of a single freshly drawn

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TABLE I.—*Parasite Counts per c.mm. in 5 "Sicklers" and 5 "Non-Sicklers" after Inoculation with 500,000 Trophozoites of P. falciparum.*

Day After Inoculation	"Sicklers"					"Non-sicklers"				
	S1	S2	S3	S4	S5	N1	N2	N3	N4	N5
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	20	10	30	40	50	20	20	90	20	60
5	10	10	10	10	0	0	10	50	10	0
6	460	810	900	440	1,040	740	840	3,620	1,380	1,860
7	270	140	10	240	30	210	70	830	290	380
8	2,720	2,640	13,980	4,520	17,720	6,140	26,280	63,360	12,420	23,920
								*		
9	110	380	80	690	180	1,260	40	1,260	6,040	4,420
10	6,120	6,940	14,280	15,780	16,040	10,920	12,540	100	23,720	18,540
11	210	1,280	1,460	2,640	570	10,820	560	20	1,500	17,400
						*				*
12	16,740	19,520	35,120	34,840	25,380	7,860	18,180	10	8,820	8,640
	*	*	*	*	*		*		*	
13	180	740	380	4,520	6,510	660	1,980	0	640	150
14	40 (25%)	60	40 (25%)	290	60	0	10	0	100 (25%)	0
15	20 (100%)	30	0	10	0	0	0		40 (100%)	0
16	50 (100%)	10	0	100 (100%)	0		0		40 (100%)	
17	0	0		20 (100%)					0	
18	0	0		20 (100%)					0	
19				10 (100%)						
20				0						
21				0						

* Chloroquine therapy instituted. Figures in parentheses represent percentage of gametocytes. Unless otherwise indicated, all parasites were trophozoites.

TABLE II.—*Parasite Counts per c.mm. in 3 "Sicklers" and 3 "Non-sicklers" After Inoculation with 50,000 Trophozoites of P. falciparum*

Day After Inoculation	"Sicklers"			"Non-Sicklers"		
	S6	S7	S8	N6	N7	N8
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	10	0	0	0	30
4	10	0	10	0	0	0
5	20	70	280	20	30	60
6	700	80	60	40	160	240
7	480	820	1,960	180	1,700	2,340
8	12,900	320	9,760	240	3,980	3,720
					*	*
9	2,040	4,280	3,920	2,320	11,320	11,800
10	27,600	780	3,760	2,540	3,370	3,100
11	4,540	13,380	5,760	8,160	710	420
12	65,400	1,780	2,720	17,300	40	280
	*					
13	4,600	23,120	14,380	34,260	0	0
				*		
14	720 (1%)	4,480	6,480	8,340	0	0
15	200 (50%)	12,620	10,620	4,480		
16	90 (100%)	9,080	6,160	70		
17	50 (50%)	1,680	6,540	0		
18	90 (100%)	2,360 (20%)	7,220	0		
19		1,180 (50%)	4,420			
20	90 (100%)	820 (50%)	1,740			
21		920 (40%)	1,200			
22		1,060 (50%)	1,460			
23		820 (15%)	1,620			
		*	*			

* Chloroquine therapy instituted.
Figures in parentheses represent percentage of gametocytes.
Unless otherwise indicated, all parasites were trophozoites.

sample of heparinized, Group O, Rh-negative blood infected with trophozoites of the El Limon, Panama strain PF 6 (Jeffery and Eyles, 1954) of falciparum malaria. In studies 2 and 3 the donor's blood was diluted in his own plasma, so that the injected volume could be measured more accurately. The parasites in 0.1 c.mm. of blood were counted directly on stained thick smears (Earle and Perez, 1932). The infection was terminated with chloroquine whenever it was considered necessary to do so for the patient's safety; the decision whether or not to interrupt the infection in any given case was based on the course of the parasite count and on the clinical condition of the patient. All patients remaining in the study for 23 days after inoculation were cured at that time.

Results

Study 1.—Ten volunteers, five "sicklers" and five "non-sicklers," were inoculated with 500,000 parasites each. The parasite counts of these 10 men are presented in Table I. As this table indicates, it was necessary to interrupt the infections of three of the "non-sicklers" before it was necessary to interrupt the infections of any of the "sicklers." The parasite counts of the "non-sicklers" tended to be somewhat higher. On day 8 the difference between the means of the logarithms of the counts of the two groups slightly exceeded two standard errors, and may therefore be regarded as statistically significant at the 0.05 level. Earlier

TABLE III.—*Parasite Counts per c.mm. of 5 "Sicklers" and 5 "Non-Sicklers" (same subject as in Table I) after Reinoculation with 50,000 Trophozoites of P. falciparum.*

Day After Inoculation	"Sicklers"					"Non-sicklers"				
	S1	S2	S3	S4	S5	N1	N2	N3	N4	N5
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	30	0	0
6	50	30	20	60	20	30	10	150	30	20
7	0	0	0	0	0	0	0	10	10	10
8	380	220	150	340	390	30	320	7,380	130	1,450
9	20	30	10	20	20	10	10	380	10	30
10	7,240	4,020	3,260	8,740	7,240	380	6,680	130,050	5,440	28,200
								*		
11	110	70	60	270	450	30	90	3,640	210	200
12	11,800	39,600	30,200	57,480	84,640	1,800	12,040	680	7,460	57,600
				*	*					*
13	90	320	380	460	90	10	70	140	40	170
		*	*							
14	9,920	20,520	9,760	90	20	880	3,540	0	1,640	470
15	70	2,360	1,640	20	0	30	150	0	40	220
16	2,860	90	70	10	0	510	7,500		1,820	20
17	190	0	0	0		30 (50%)	150		70	100
18	1,540 (20%)	0	0	0		170 (50%)	2,260 (50%)		2,200 (25%)	30
19	250 (95%)					110 (100%)	1,440 (100%)		530 (100%)	0
20	2,960 (15%)					270 (100%)	2,100 (80%)		1,780 (75%)	0
21	510 (70%)					360 (100%)	1,380 (99%)		1,080 (99%)	
22	4,720 (5%)					480 (98%)	2,180 (50%)		3,620 (80%)	
23	780 (50%)					440 (100%)	1,200 (99%)		920 (99%)	
	*					*	*		*	

* Chloroquine therapy instituted. Figures in parentheses represent percentage of gametocytes. Unless otherwise indicated, all parasites were trophozoites.

differences did not reach this level of significance; later comparisons were not valid because of the interposition of treatment of some of the volunteers.

Study 2.—Because it was thought that 500,000 parasites might have been an overwhelming inoculum, six other volunteers, three "sicklers" and three "non-sicklers," were given an injection of only 50,000 parasites. The parasite counts of these subjects are presented in Table II. It was necessary to interrupt the infection in two of the three "non-sicklers" before it was necessary to interrupt the infections of any of the "sicklers."

Study 3.—In an attempt to determine the effect of acquired immunity on the resistance of "sicklers" and "non-sicklers" to malaria, the same 10 volunteers who had been inoculated with 500,000 parasites in study 1 were reinoculated with 50,000 parasites after a lapse of four months. The parasite counts during this study are presented in Table III. Up to and including day 10, when treatment was started on subject N3, the means of the logarithms of the parasite counts of the "sicklers" and "non-sicklers" never differed to a statistically significant degree. Although it was necessary to treat two of the five "non-sicklers" relatively early in the course of their infection, the other three were able to continue for the remainder of the study, while only one of the "sicklers" was able to do so.

Discussion

In comparing the resistance of individuals with and without sickle-cell trait to malaria, we have been able to demonstrate only unimpressive differences of questionable significance. These findings differ from those of Allison (1954). There are several possible explanations for this difference in results. While Allison used an African and a Malayan strain of falciparum malaria, we used a Panamanian strain. It is conceivable, although it does not appear very likely, that strain differences between the parasites used were sufficient to account for the different results. His subjects were highly immune; ours were non-immune in studies 1 and 2, and only slightly immune in study 3. It is also possible that any advantage which sickle-cell haemoglobin gives an individual infected with malaria is so slight in itself as to become manifest only when a high degree of acquired immunity already exists.

It would appear that further work is necessary to evaluate conclusively the role of sickle-cell haemoglobin in resistance to malaria.

Summary

Eight non-immune men with sickle-cell trait and eight non-immune men whose red cells contained only normal haemoglobin were inoculated with *P. falciparum* intravenously. Ten of these men were reinoculated four months after their initial course of malaria. The resulting parasitaemias tended to be somewhat less marked in the men with the sickle trait than in those without the trait, but the difference observed was unimpressive and of questionable significance.

We acknowledge the helpful advice of Dr. Alf S. Alving, of the Department of Medicine, University of Chicago, Illinois. The investigations reported in this paper would not have been possible except for the co-operation of the inmates and the administrative staff of Stateville Penitentiary, Joliet, Illinois, U.S.A.

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EMERGENCY MITRAL VALVOTOMY AT FULL TERM

REPORT OF A CASE

BY

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Several reports have appeared in recent literature on the value of mitral valvotomy during pregnancy (Baker *et al.*, 1952; Logan and Turner, 1952; Sellors *et al.*, 1953; Mulcahy, 1954). These emphasize that, in a limited and properly selected group of cases, this procedure may play an effective part in lessening disability, and thus help to reduce the maternal mortality rate due to heart disease. These reports advise that, when indicated, operation should take place during the first trimester or as early in pregnancy as possible, and most of the recorded valvotomies in pregnant women have been done during these early months.

We here record the case history of a patient with pure mitral stenosis who had a valvotomy performed at full term, ten hours before the birth of her ninth child. No such case has so far been recorded, though the feasibility of this procedure at all stages of pregnancy has been suggested previously (Mulcahy, 1954).

Case Report

A married woman aged 35 was admitted to the Coombe Maternity Hospital on November 29, 1954, in the early stages of labour. She had been a "defaulter" from the antenatal clinic. Apart from the normal labour pains, she was observed to be considerably distressed with dyspnoea, orthopnoea, cough, and cyanosis. On examination she was found to have pure mitral stenosis. She was in regular rhythm, and, though there was no evidence of heart failure, she was regarded at the time as a likely subject for a later pulmonary oedema. This impression was supported by the tachycardia, the loud slapping first sound following the unusually harsh mid-diastolic and presystolic murmur, the easily palpable right ventricle and pulmonary artery, and the evidence of early pulmonary venous congestion on the skiagram taken twenty-four hours after admission. The film also revealed a large left auricle and pulmonary artery, but only minimal cardiac enlargement. Further factors, obviously important in her case, were the six-weeks history of persistent non-productive cough and the presence of anaemia, her haemoglobin being 55%.

This patient had attended the antenatal clinic beforehand, but, despite a history of increasing distress on exertion and of a long-standing cough, she had failed to report anything abnormal. At no time had she complained of haemoptysis. During her earlier pregnancies, the last having been 22 months previously, she recalled no notable symptoms, nor was she informed of any abnormality in the heart. There was no previous history of rheumatic fever.

Treatment was started at once. It included penicillin, 500,000 units twice daily, digoxin, 0.25 mg. eight-hourly, sedation, and efforts to suppress the cough. Notwithstanding these measures and despite the cessation of labour pains a few hours after admission, her condition showed little or no improvement. Morphine, ¼ gr. (10 mg.) six-hourly, intravenous aminophylline, and streptomycin were added

48 hours later, but next day (December 2) the probability of pulmonary oedema was more apparent. The heart sounds were now loudly slapping and the presystolic murmur was unusually harsh. A most noticeable feature was the obvious pulsation of the right ventricle and pulmonary artery, causing a parasternal lift of exceptional degree. This was a warning of the likelihood of pulmonary oedema—particularly, we believed, in the event of the resumption of labour. Some impairment of air entry in the base of the left lung was obvious for about two days, but by now increasing consolidation was apparent. This was an added complication and appeared to be uninfluenced by the antibiotics administered. In view of the patient's steady deterioration valvotomy as an urgent measure was advised.

The operation was performed uneventfully three days after admission. The lower lobe of the left lung showed considerable congestion when the thorax was opened, but this did not interfere with the surgical manipulations. The left auricular appendage was large and free of clot, and was dealt with in the routine manner. As expected, the valve was tight, but both commissures separated without difficulty. The pulmonary artery was large and tense at first, but less so towards the end of the operation. The patient was returned to the ward in a satisfactory condition, and after a short labour a live infant, weighing 8 lb. 4 oz. (3.7 kg.), was born 10 hours later without difficulty or distress to the mother.

She had more than the usual post-operative cough and sputum from the residual congestion and atelectasis of the left lower lobe. These symptoms, however, responded within a few weeks to antibiotics and symptomatic treatment. Her convalescence was otherwise quite uneventful, and she was discharged on December 31.

She has since been seen by us. Her general condition seems to be quite good, and there is considerable modification of the physical signs in her heart, the mid-diastolic bruit being shorter and audible only when she is lying on her left side. She is leading a normal active life, as she was before the start of her last pregnancy.

Comment

This case history illustrates the value of mitral valvotomy as an emergency procedure during the later months of pregnancy. The presence of moderate anaemia and of long-standing persistent coughing undoubtedly played an important part in this patient's final and irreversible deterioration. It is unlikely that valvotomy at this stage would have been necessary in the absence of these influences, and we are of the opinion that the avoidance of such important aggravating factors during pregnancy should almost preclude the necessity for operation at such a late stage. There is, however, still a definite indication for valvotomy in the early months of pregnancy in properly selected patients.

We are indebted to Dr. J. K. Feeney, Master of the Coombe Lying-in Hospital, under whose care this patient was admitted, for his advice on the obstetrical problem, and for the facilities afforded in his hospital; to Dr. M. I. Drury, consulting cardiologist, National Maternity Hospital, Dr. R. Davys, anaesthetist, and Mr. J. G. Maher, assistant surgeon, St. Vincent's Hospital, Dublin, for their invaluable assistance.

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"When should baby wear shoes?" This is typical of the questions answered in *Our Children's Feet*, a pamphlet for parents issued by the Foot Health Educational Bureau of the Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1 (price 6d.).

RESERPINE IN TREATMENT OF CHRONIC PSYCHOTICS

PRELIMINARY OBSERVATIONS

BY

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Recent work in America (Kline, 1954) on the treatment of psychotics with rauwolfia and its alkaloids suggests that the ancient Indian belief in the value of this root in the treatment of mental illness was well based. In view of that work it was decided to try the effect of this drug on a group of chronically mentally ill patients. The group, a small one of 32 male patients, consisted of 26 schizophrenics, 4 cases of schizophrenia superimposed on basic mental defectiveness, 1 chronic melancholic, and 1 with arrested G.P.I. The patients varied in the date of their admission to hospital from 1912 to 1952, all but six having been in this hospital for over five years.

They were segregated into a section of one of the wards for mentally disturbed males under a senior nurse, and it was arranged that their nursing care should be, so far as possible, maintained by the same nurses.

In choosing the patients for this test, only those in a satisfactory physical state were included, and all showed behaviour problems. Thus 11 were noted to be destructive, 13 were faulty in their habits, 11 were liable to impulsive violence, 4 required regular spoon-feeding, and others needed considerable prompting and occasional spoon-feeding with their meals. All 32 were unoccupiable. The degree of destructiveness among these patients was great. One of them, the most destructive in the hospital, destroyed on an average one blanket a night and one mattress a week, and had started to gnaw the wood on his bed.

Procedure

Initially, six patients were treated with reserpine ("serpasil"), being given 1 mg. four times a day, which seemed to be the dose most commonly used by the American authorities. In view of its known hypotensive effect, daily blood-pressure readings were taken on all patients for the five-months period of the trial. In addition four-hourly temperature and pulse rates were charted at first, but, as no significant findings were noted, these were later reduced to morning and evening readings. The hypotensive effect was variable: whereas most patients showed an initial small drop, in one or two the blood pressure fell considerably. Readings of 60/50 and 64/46 were obtained in two cases. These low blood-pressure readings were not found until the patients had been on reserpine for more than two weeks, and in both cases they were symptomless. Their occurrence, however, suggests the importance of regular blood-pressure readings when patients are first treated with this drug. The blood pressure in both these cases later returned to normal on a slightly smaller dose. Following this, it was decided to start with smaller amounts, and 0.5 mg. three times a day became the initial dose. The dose was constantly under review in all cases, and from the experience gained it seems that there is no fixed dose, though it was found that the effective dose varied from 0.5 to 1 mg. four times a day. In all cases the drug was administered by mouth.

Results

In one case the maximum improvement was noted when one dose was given during the night. Without this dose the patient's condition relapsed during the night, but he rapidly

improved after his morning dose. In the cases that responded to reserpine some sign of improvement was usually noted between the first and second weeks of treatment, but several showed definite improvement within three days, while others were unchanged for three months and then improved.

The results of the treatment in the first small group of six patients were most encouraging. The highly destructive and degraded patient mentioned above became clean and tidy, and lost his destructive habits within four days of being put on reserpine; and others of this group showed comparable improvement.

Other patients suffering from chronic psychosis were added to the series, and the effect of the drug on them compared with the rest of the ward was most marked. The reserpine patients became quiet and co-operative; impulsive actions and destructiveness disappeared; they fed themselves at meals, and helped each other at the table, in marked contrast to their former habits and those of the untreated patients in the ward. Occupational therapy classes were started, and 20 of the 32 patients were regularly employed in these sessions; 12 of these also did some form of useful work in tidying the ward, etc.

The main difference in the patients under reserpine, apart from the disappearance of the antisocial behaviour, was their receptibility to ideas and suggestions, whereas previously such suggestions had had no effect. Considerable prompting was needed to start occupational therapy and to improve table manners, but, once accepted by the patient, they were maintained.

Appetite was greatly increased and difficulties with feeding disappeared. The dietary had to be increased, as the normal amount did not satisfy their appetites. One patient, who used to stick his fingers down his throat and vomit after food, completely lost this habit and took his meals normally. Weight increase was variable, but the 32 patients, who were all weighed weekly, gained an average of 6 lb. (2.7 kg.).

Many patients now enjoy cinema shows, patients' dances, and other recreations, whereas previously they were not thought suitable for such activities.

Of the 32 patients, 4 were regarded as greatly improved, 14 much improved, 9 slightly improved, 3 not improved, and 2 worse. (The 5 patients who did not improve were 3 schizophrenics, 1 chronic melancholic, and 1 G.P.I.)

Combination with other Forms of Therapy

One schizophrenic of five years' standing, who had been mute, hallucinated, incontinent, and utterly detached, became more alert, tidy in appearance, but still would not speak. He was given a short course of electric convulsion therapy, and promptly spoke normally and rationally, and for a time appeared to be making an amazing remission. This remission was, however, only temporary, and he again became mute and withdrawn. He was then started on insulin therapy, the reserpine being maintained while he was receiving subcoma doses of insulin. Some response has been noted, but not to a degree comparable to that previously found.

Side-Effects

Some drowsiness was noted with the higher doses, but this could be successfully combated by small doses of amphetamine sulphate. Little difficulty was experienced with looseness of the bowels, which was only transient when it did occur. Stuffiness of the nose was noted in a few cases, but caused no great inconvenience.

Three cases developed oedema—in two, of the legs only, but in one of the face as well as the legs. These cases were carefully investigated. A cardiovascular or renal origin for the oedema was excluded. Estimation of blood urea, protein, albumin, globulin, thymol turbidity, alkaline phosphatase, van den Bergh, bile, serum sodium, serum potassium, and serum chlorides, together with complete blood counts, gave normal results. The occurrence of oedema has been noted in Switzerland (C. Dale Falconer, personal communication). Gaunt *et al.* (1954), writing on the endocrine aspects of the pharmacology of reserpine, suggest that the drug stimulates the release of an antidiuretic hormone in the posterior pituitary in rats, and this may possibly be the mechanism of the oedema production in these cases.

Opinion

While this group is too small to allow of a dogmatic opinion, the results obtained strongly suggest that reserpine has brought about a marked change in a ward consisting mainly of long-standing schizophrenic patients with gross behaviour disorders. The change in the nursing staff's work is most pronounced. Instead of custodial care, there is now considerable scope for active rehabilitation, with, as a result, increasing interest and enthusiasm in the work. Another striking point is the reduction in the amount of bed-linen and clothing destroyed by patients. Finally, the disappearance of incontinence among this group has been most dramatic; and this, combined with improvements in behaviour, encourages one to hope that such patients may in future be nursed in better wards, with greater amenities.

Summary

Thirty-two chronic mentally disturbed patients were treated with reserpine for periods of up to five months.

In the great majority, considerable improvement was noted in their habits and personal appearance and in their ability to occupy themselves. Impulsiveness and incontinence disappeared. A marked quietening effect was noted. Even those patients showing definite signs of dementia were superficially improved. Side-effects were slight, and occurred in only a few cases. Most patients who are going to respond show signs of this within a week or two, but some were on the drug for three months before definite improvement was noted. It is therefore suggested that, unless the patient's condition deteriorates, the method should be given at least a three-months trial.

The promising results obtained in this small sample of mentally disturbed patients suggest that an extensive trial of reserpine in psychotics of more recent onset should be made.

It seems to be important to make full use of occupational and recreational therapy so as to provide the stimulus for activities which the drug appears to permit.

I would like to thank Dr. A. C. Sinclair, medical superintendent of Herrison Hospital, for permission to publish this report; Ciba Laboratories Limited for a generous supply of serpasil; Dr. T. V. Cooper, of the Dorset County Laboratory, for carrying out the special investigations on the oedematous cases; and, finally, the nursing staff for their help and co-operation.

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The Annual Report for 1954 of the department of rheumatology at the Royal Free Hospital comments on the reduction in the length of stay in hospital of patients who are admitted for the treatment of rheumatic diseases. This applies to all the disorders in the rheumatic group of diseases except osteoarthritis. In the case of rheumatoid arthritis, for instance, the average stay in 1954 was 48 days, compared with 61 days in 1953, and for ankylosing spondylitis the average stay in hospital was reduced from 63 in 1953 to 35 days in 1954. This reduction in hospitalization, the report remarks, is largely due to the more plentiful supply of hydrocortisone, which has enabled the department to treat isolated peripheral joints more effectively, and to the policy of using long-term hormone therapy in those cases which have failed to respond to other available forms of treatment.

POSTERIOR PITUITARY SNUFF TREATMENT OF NOCTURNAL ENURESIS

BY

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It is not proposed to review the vast literature dealing with the causation and treatment of nocturnal enuresis. For the purpose of this article it will suffice to state that adolescent and adult sufferers exist in whom no obvious psychiatric or physical disorder can be found, and in whom accepted measures of treatment are of little value. Many such patients also suffer nocturnal frequency, and it is apparent that they have either relative nocturnal polyuria or that their bladders have a subnormal capacity. Such patients might be expected to benefit by a reduction in urine formation during sleep. The use of pituitrin snuff in cases of diabetes insipidus was first reported in 1924 by Choay and Choay; and Vidgoff (1932) and Smith (1934) reported full control of this condition by the use of snuff at eight to ten-hour intervals. It is well known that pituitrin has a similar depressant effect on the urine flow in normal persons (Gutmann, 1928).

Bonacorsi (1925), Blau (1926), and Jacobs (1930) reported the use of pituitrin in the treatment of nocturnal enuresis in children. It is difficult to understand the mode of action of the drug in these cases, as good results were stated to have followed short courses of injections of the drug. More recently, Hansen (1954) has reported satisfactory treatment of nocturnal enuresis by nightly administration of posterior pituitary snuff ("di-sipidin"). He found the results less satisfactory in small children. In none of these reports has the effect of pituitrin been contrasted with placebo therapy, and thus the possibility of a psychotherapeutic effect has not been excluded.

In the present study, four adolescent patients have been treated with pituitrin snuff or placebo snuff over periods of seven to eleven months. They are a special group in that each patient had persistent and frequent nocturnal enuresis, was normal on physical examination, appeared on general assessment to be of normal intelligence, and showed no marked psychiatric disorder. Throughout the period of study the patients kept a strict chart showing each night when enuresis or frequency occurred. The patients were seen every two to four weeks, and at each visit they received a sealed prescription for either pituitrin or placebo snuff, and this was dispensed at the hospital pharmacy. The patients were informed that different types of snuff would be prescribed, but did not know when a change was made or that placebo snuff was being given. The placebo snuff was identical in appearance to the pituitrin snuff. Each patient was instructed to avoid fluids within three hours of sleep, and immediately before retiring to bed a large pinch of snuff was inserted well into each nostril. (The dose was approximately 100 mg.)

Case 1

A sensitive and intelligent girl aged 19, a printer, was first seen on April 26, 1954. She complained of lifelong bed-wetting, usually occurring one to three times a week. The longest remission prior to present treatment had been for six weeks, and occurred three years previously. A large quantity of urine was voided when enuresis occurred. She had always been a very deep sleeper and was never awakened by the discomfort of a full bladder or by incontinence. She had received various forms of medical treatment in the past without effect. She had tried avoiding fluids for four hours before sleep, but this measure was ineffective. There was no history of serious illnesses or any family history of enuresis. The prospect of enuresis persisting into adult life naturally caused considerable anxiety to the patient, but she was otherwise free from worries and enjoyed a happy social background. She normally slept from 10.30 p.m. until 6.30 a.m. On examination there were no abnormal physical findings. The urine was free from sugar and contained a trace of albumin. Microscopy of the urine was normal, as was an intravenous pyelogram.

No fluids were taken after 6 p.m. Within the period April 26 to December 5, 1954, pituitrin snuff was administered intermittently for a total of 26 weeks (182 days); during this time nocturnal enuresis did not occur on a single occasion. She received placebo snuff during six weeks (June 14 to July 5 and October 18 to November 8), and during these periods nocturnal enuresis occurred on 21 occasions (50% nights).

Case 2

A girl aged 15, a factory worker, was first seen on November 23, 1953. She complained of lifelong bed-wetting, usually occurring five or six times a week, a large quantity of urine being voided. She had always been a very deep sleeper and could not be awakened by a loud alarm clock. During a period in which she received amphetamine sulphate in a dosage sufficient to cause insomnia, the enuresis had been largely replaced by nocturnal frequency. Apart from this she had never experienced a remission for longer than two days. She had also suffered from lifelong diurnal frequency, which had been an embarrassment to her at school. There was a previous history of pink disease in the first year, attacks of migraine since the age of 4, and a mastoidectomy at 11. There was no family history of enuresis. She confessed to a certain amount of friction between her mother and herself, no doubt accentuated by the frequent bed-wetting, but was otherwise a happy person with enuresis as her only serious worry. She normally slept from 10.30 p.m. to 7 a.m. Examination revealed a small girl of average intelligence. There were no abnormal physical findings. The urine was free from albumin and sugar, and on microscopy was normal.

No fluids were taken after 7.30 p.m. Within the period November 23, 1953, to November 1, 1954, pituitrin snuff was administered for a total of 37 weeks (259 days); during this time nocturnal enuresis occurred on 10 occasions (3.9% total nights). On four of these occasions the patient had a coryza with profuse nasal discharge and she was unable to retain the snuff properly. She received placebo snuff for a total of nine weeks (January 18 to 25, 1954; May 17 to June 14; and November 1 to 29); during this time, when no coryza occurred, she had nocturnal enuresis on 19 occasions (30.2% nights).

Case 3

A youth aged 18, a fitter, was first seen on April 5, 1954. He complained of lifelong bed-wetting, which usually occurred from two to seven times a week, a large quantity of urine being voided. His longest remission had been for ten days. He had always been a very deep sleeper. The avoidance of fluids for four hours before sleep had proved ineffective. There was no history of serious illnesses or any family history of enuresis. Apart from the enuresis the patient said that he was free from worries and had a happy home background. He normally slept from 11.15 p.m. to 6 a.m. On examination there were no abnormal physical findings. The urine was free from albumin and sugar.

No fluids were taken after 7 p.m. Within the period April 5 to November 29, 1954, pituitrin snuff was administered

for a total of 30 weeks (210 days); during this time nocturnal enuresis occurred on 10 occasions (4.8% total nights). The patient volunteered that the quantity of urine voided into the bed was much diminished. He received placebo snuff during six weeks (May 10 to 24 and October 4 to November 1), and during this period nocturnal enuresis occurred on 10 occasions (23.8% nights). After both periods when placebo snuff had been given the patient remarked, "This last snuff was not as good as the previous stuff." He based this upon the increased frequency of enuresis and the quantity of urine passed.

Case 4

A youth aged 16, a clothing warehouse assistant, was first seen on April 12, 1954. He complained of lifelong enuresis, usually occurring once or twice a week, the longest remission having been for two weeks. He had also suffered from lifelong nocturnal frequency, which occurred once or twice nightly, except when replaced by enuresis. If, however, he did not awaken during the night there would be an even chance of enuresis occurring. There was no past history of serious illness and no family history of nocturnal enuresis. While naturally perturbed by the persistent bedwetting, he was otherwise free from worries and had a happy social background. He normally slept from 10.30 p.m. to 6.30 a.m. Examination revealed a boy of average intelligence and asthenic build. There were no abnormal physical findings. The urine was free from albumin and sugar. An intravenous pyelogram was normal.

No fluids were taken after 7 p.m. Within the period April 12 to November 29, 1954, pituitrin snuff was taken for a total of 26 weeks (182 days); during this time nocturnal enuresis occurred on 10 occasions (5.5% total nights), nocturnal frequency on 81 nights (44.5% total), and on the remaining nights (50%) he slept without incident (see Table I). He received placebo snuff for seven weeks (July 19 to September 6), and during this period nocturnal enuresis occurred on nine occasions (18.4% total nights), nocturnal frequency on 31 nights (63.2% total), and he slept without incident on nine nights (18.4% total).

TABLE I.—*Incidence of Nocturnal Enuresis and Nocturnal Frequency during Administration of Pituitrin Snuff and Placebo Snuff in Case 4*

Snuff	Duration in Days	Nocturnal Enuresis		Nocturnal Frequency		No Incident	
		Nights	%	Nights	%	Nights	%
Pituitrin	182	10	5·5	81	44·5	91	50·0
Placebo	49	9	18·4	31	63·2	9	18·4

Analysis of Results

The difference in frequencies of nocturnal enuresis during administration of pituitrin and placebo snuff were worked out by "2 × 2" tables, making use of χ^2 method (Fisher, 1946). Table II shows the results. In Cases 1, 2, and 3, $P<0.001$, which indicates that the possibility of the results being a chance finding is less than one in a thousand. In Case 4 $P<0.01$, indicating that the possibility of a chance finding is less than one in a hundred. It is clear that in all four cases there is a marked reduction in the incidence of enuresis during pituitrin treatment, the reduction being very highly significant in the first three patients.

TABLE II.—*Analysis of Incidence of Nocturnal Enuresis in Four Adolescent Patients during Total Period in which they Received either Pituitrin or Placebo Snuff*

Case No.	Snuff	Wet Nights	Dry Nights	χ^2	P
1	Pituitrin	0	182	100·4	<0·001
	Placebo	21	21		
2	Pituitrin	10	249	42·8	<0·001
	Placebo	19	44		
3	Pituitrin	10	200	17·38	<0·001
	Placebo	10	32		
4	Pituitrin	10	172	8·48	<0·01
	Placebo	9	40		

Discussion

The list of therapeutic measures—medical, surgical, and psychiatric—bears witness to the relative inefficacy of any one of them in the treatment of nocturnal enuresis. Although first suggested by Bonacorsi (1925), the use of pituitrin in the relief of this condition has received scant attention in the literature. This is surprising, as the well-known effect of pituitrin in reducing the urine output might reasonably be expected to benefit certain patients. Hansen (1954), has reported satisfactory results with pituitrin snuff in older children and adults, and cites one case in which the incidence of nocturnal enuresis was reduced from nightly to once or twice a month.

This present study has been limited to four adolescent patients, comprising a selected group in that they were all of average intelligence, had a satisfactory social background, and were free from obvious physical or psychiatric defect. The possibility of a psychotherapeutic effect has been excluded by comparing the results obtained with pituitrin snuff with those during placebo administration. A reduced incidence of enuresis occurred in each patient during the periods in which pituitary snuff was taken each night. The most favourable response (Case 1) consisted in complete relief from nocturnal enuresis during 23 weeks in which pituitrin snuff was taken, enuresis occurring frequently during the two periods in which placebo snuff was substituted. One patient suffered nocturnal frequency as well as enuresis, and a reduced incidence of both symptoms was observed during pituitrin therapy (see Table I). No untoward effects were experienced during this study, and the only difficulty in administration was observed in the one patient who was unable to retain snuff completely in the presence of a coryza.

Pituitrin snuff is variously reported as acting for five to ten hours, and the shorter the period of sleep the more effective cover it should give. It may well prove of little value in children requiring upwards of 12 hours' sleep, but in adolescents and adults sleeping for eight to nine hours its effect is likely to persist for most of this time and should thereby effect an overall reduction in urine production during the period of sleep.

The results leave little doubt about the effectiveness of this form of treatment in the cases studied. They support Hansen's findings and suggest that pituitrin snuff therapy deserves a full trial in any adolescent or adult patient failing to respond to other forms of treatment.

Summary

Four adolescent patients with nocturnal enuresis have been treated with pituitrin snuff for six to nine months, and the results have been compared with those observed during the administration of a placebo snuff. Although obtained from a small series of selected cases, the results suggest that pituitrin snuff will prove of great value in the treatment of certain adolescent and adult cases of nocturnal enuresis.

I wish to thank Dr. W. MacAdam for referring Case 1; Dr. J. G. Dare for advice on the statistical analysis; and Professor R. E. Tunbridge for his helpful criticism in the preparation of this paper. I am indebted to Messrs. Paines and Byrne Ltd. for the supplies of "di-sipidin" and the placebo snuff.

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Medical Memorandum

Anaphylactic and Purpuric Manifestations due to Procaine Penicillin G in Aqueous Suspension

Although many millions of penicillin injections are given each year in almost every corner of the globe, the incidence of reported serious reactions is amazingly low. With its indiscriminate use, many of the drug's serious potentialities have often been overlooked, and it may be with surprise that one reads of 15 reported deaths in a period of 18 months from March, 1952 (Kern and Wimberly, 1953), and of a series of 20 unreported deaths collected by Welch and his co-workers (1953) by sending questionaries to 95 large general hospitals in the country. Other serious reactions that have been reported include anaphylactic shock (Pick and Patterson, 1953), peripheral neuritis (Kolb and Gray, 1946), convulsions (Talbott, 1948), exfoliative dermatitis (Langdon, 1950), and severe serum-sickness type of reactions (Keefer *et al.*, 1943). Mention, too, has been made of the possible relationship of penicillin reactions to the later development of periarteritis (Harkavy, 1952) and lupus erythematosus (Gold, 1951).

A case of unusual penicillin sensitivity manifested by purpura and anaphylactoid type of reaction is here reported. Purpura (Criep and Cohen, 1951) is not a particularly common complication of penicillin administration, and its association with anaphylaxis is even less common. However, there have been reports of fatal reactions involving purpuric manifestations (Welch *et al.*, 1953). Cases have been reported of purpura as the sole manifestation, of purpura associated with other skin lesions or with serum-sickness type of reactions. Anderson (1947) reports a case of purpura associated with melaena and hematuria. In all cases so far the platelet count has been reported as normal.

Case Report

A healthy white man of 28, with no past or family history of allergy, had always been in good health and to his knowledge had never received penicillin in any form. He had received procaine for dental work on several occasions without untoward reaction. His only complaint was that since serving in the second world war he had had a persistent mild recurrent epidermophytosis.

For a month before his hospital visit he had had a mild folliculitis of one buttock, which in the last two days had begun to spread so that he had developed an area of cellulitis with a fluctuant centre. There were no constitutional symptoms.

Prior to incision he was given 600,000 units of procaine penicillin G in aqueous suspension into the gluteal region. There was no immediate reaction, but four hours later he developed a generalized burning of the skin of the legs and trunk, and about an hour later, while urinating, noticed the development of a purpuric rash on his legs and in his groin. On examining himself further, he noticed that the rash was also present in his antecubital fossae and around the neck band. He was not alarmed, as he assumed that he was having a reaction to penicillin, having heard of and seen this type of thing before. He kept on working at his job as a truck helper. However, nine and a half hours after the injection he very suddenly felt quite ill and became apprehensive, pale, dizzy, and nauseated. His bowels moved and he had profuse watery stools.

On physical examination the patient was well nourished and well developed. He was pale, anxious, and sweating. His temperature was 97.6° F. (36.4° C.), pulse 120, and blood pressure 84/60 (usual blood pressure 120/75). Examination of his heart, lungs, and abdomen was unremarkable, but all over the body were scattered petechiae. These were widely scattered on the arms and upper trunk, but were marked, confluent, and ecchymotic on the legs and in the groin. There was no unusually severe reaction at the site of the injection. The rash was also confluent in the antecubital fossae and around the neck. No petechiae were noted on the mucosal surfaces. At this time the hands and feet were slightly swollen. The tourniquet test (80 mm. for five minutes) was strongly positive.

He was immediately treated with adrenaline, ephedrine, and tripelennamine, and his anaphylactic symptoms regressed rapidly, his pulse and blood pressure returning to normal. Although for the next eight hours he kept on with the ephedrine and tripelennamine, his rash continued to spread. At the end of this time the rash no longer spread and he retired to bed, spending a restless night. There was minimal itching of the affected areas. At the height of the rash he showed 10 to 15 red blood cells per high-power field in his centrifuged urine specimen.

Next day he was taken off all medications. He was kept in bed for a week, making an uninterrupted clinical recovery, the skin lesions fading, with desquamation over the affected areas. Laboratory studies 24 hours after the onset of symptoms showed:—Blood: haematocrit, 48%; red cells, 5,610,000 per c.mm.; white cells, 14,200 per c.mm.; differential count normal except for 6% eosinophilia; red cells normal on smear; platelets, 202,000 per c.mm.; bleeding-time, clotting-time, and clot retraction were all within normal limits. The tourniquet test (five minutes at 80 mm. Hg) was positive. Urinalysis showed a trace of albumin and 10 to 15 red blood cells per h.p.f. Culture of pus taken from abscess at time of incision showed *Staphylococcus albus* resistant to penicillin.

Five days after onset the laboratory findings had returned to normal with the exception of the leucocytosis, which had risen to 23,000 with a shift to the left, and 4% eosinophils. The leucocytosis gradually subsided, so that within three weeks after the onset of the illness it was 10,000, with a normal differential.

Scratch tests to penicillin G solution and to procaine were negative, but there was a slight weal when using the procaine and penicillin G in aqueous suspension. Permission to inject intradermally dilutions of this was refused. Subsequent patients were given injections from the same bottle that was used on this patient without adverse effects.

Comment

It would seem that this was a case of severe reaction to procaine penicillin G in aqueous suspension in a patient in whom there was no knowledge that he had ever received penicillin before. However, it may be that he actually had had it prescribed for a minor laceration or skin lesion in the past without his knowledge when this type of medication was used locally rather extensively, or he may have had a cross-sensitivity with one of the fungi which had caused his athlete's foot, for this cross-sensitivity has been reported (Peck *et al.*, 1948). Although prior skin testing and questioning probably would not have helped in the decision to administer the penicillin, this case emphasizes the caution necessary in giving this drug, especially in combination with another foreign substance such as procaine. As it turned out, the organism was insensitive to the drug, and the only potentialities procaine penicillin had were for harm in this case, and time alone will tell whether any more serious manifestations are likely to follow these immediate severe anaphylactoid reactions.

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Reviews

CLINICAL BACTERIOLOGY

Clinical Bacteriology. By E. Joan Stokes, M.B., B.S., M.R.C.P., M.R.C.S. Foreword by A. A. Miles, C.B.E., M.D., F.R.C.P. (Pp. 288+vii; illustrated. 20s.) London: Edward Arnold Ltd. 1955.

The methods used in different laboratories for bacteriological diagnosis are more diverse than in any other branch of applied pathology. The value of the results obtained depends not only on the methods used but on a high degree of technical skill in their application, and on a capacity for distinguishing between grain and chaff which only comes with experience. An account of how to do such work well is therefore a welcome addition to medical literature. Dr. Stokes's book centres round two chapters on how to isolate bacteria from various types of specimen, but others follow on the identification of species, on serological tests, on work involving antibiotics, and on the study of cross-infection. There is also a separate chapter on the investigation of tuberculosis and mycoses, and a final purely technical one dealing chiefly with the composition of culture media.

If the admirable methods advocated were generally followed, the standard of work in clinical laboratories would be greatly improved. They are perhaps a little idealistic and lavish: thus it is often said that three separate cultures should be made for incubation under different atmospheric conditions, whereas it can often be confidently anticipated that one will serve. It is rightly insisted that direct stained films should be made from specimens before cultivation as a guide to their bacterial content, and, indeed, to the cultural methods required. Oddly enough, this is said to be unnecessary for urine; if the author had made a practice of doing this she might be less sceptical about the frequency of mixed infections of the urinary tract. A healthy common sense is displayed in advocating that cultures consisting of saprophytes should be discarded: clinicians are being misled wholesale by detailed reports enumerating species of no consequence. Interesting methods advocated are the anaerobic incubation of all cultures for the identification of haemolytic streptococci, and an "optochin" sensitivity test for identifying pneumococci; the similar use of bacitracin for Group A *Streptococcus pyogenes* might have been mentioned. A little more might with advantage be included about simple technique: there are no instructions about how to spread a plate, and two useful tricks which have been devised for the direct demonstration of tubercle bacilli in cerebrospinal fluid are not mentioned.

This book sets a very high standard, particularly in insisting on full species identification, and in the principles laid down in an introductory chapter on the interpretation of results. It is much to be hoped that it will become a recognized guide to the practice of clinical bacteriology.

L. P. GARROD.

DISSEMINATED SCLEROSIS

Multiple Sclerosis. By Douglas McAlpine, M.D., F.R.C.P., Nigel D. Compston, M.A., M.D., M.R.C.P., and Charles E. Lumsden, M.D. (Pp. 304+viii; illustrated. 35s.) Edinburgh and London: E. and S. Livingstone Ltd. 1955.

The title of this book is perhaps unfortunate. "Disseminated sclerosis" is a term familiar to all medical practitioners and many laymen in Great Britain, but it is conceivable that some will not realize that "multiple sclerosis" is synonymous. The first eleven chapters discuss aetiological factors, clinical and laboratory investigations, and problems of prognosis, diagnosis, and treatment. Aetiology makes an unexpected reappearance in Chapter 13.

Most neurologists have taken the view in the past that when disseminated sclerosis is diagnosed in two or more members of one family the probability is that the diagnosis is incorrect and that the patients will, in fact, be found to be suffering from a different condition genetically determined. These authors take the opposite view and think the incidence of "familial" (though this does not necessarily mean "hereditary") examples is so considerable as to be of diagnostic significance. Their observations show that trauma is an aetiological factor in no less than 14%: the history of trauma was allowed to extend back for three months and even included such minor injury as dental extraction. It is strange that aggravation by pregnancy and parturition are largely discounted; it would seem not unreasonable to assume that, if extraction of a tooth can aggravate this disease, the trauma of parturition might well do so, quite apart from its psychological effects. Many neurologists believe that the disease does not occur in those of inferior intelligence, and some think there is a clear-cut pre-sclerotic personality; here these views are not mentioned, even to be discarded. Although emotional factors are accepted as being of some importance, no word with the prefix "psych-" appears in the index.

It is unfortunate that the important suggestions of Professor Platt (*British Medical Journal*, 1955, **1**, 179) were not available before the book went to print. He suggests that artificial feeding in infancy may sow the seeds of this disease, and advances impeccable, if theoretical, biochemical arguments; such a view might well provide the answer to the curious geographical distribution of the disease.

Chapters 12 and 13 bring the problems of neuropathology completely up to date, and include a detailed review of the world's literature on this subject, together with many other possibly related, though rare, conditions, and for the specialist these two chapters must be considered to constitute the most authoritative article at present available.

HUGH GARLAND.

PSYCHOSOMATIC MEDICINE

Modern Trends in Psychosomatic Medicine. Edited by Desmond O'Neill. (Pp. 375; illustrated. 55s.) London: Butterworth and Co., Ltd. 1955.

This book of twenty-one chapters by numerous contributors constitutes a comprehensive survey of the field of psychosomatic medicine. The subject is of immense importance to both general practitioners and specialists; it is to the former that this book may make a particular appeal. Most of the chapters are written in a straightforward manner, are practical, and are concerned especially with the problem of aetiology and treatment. I am glad that this is so, because every day it is becoming more important that the doctor of the future should be a man who has been adequately and fully trained. That, of course, means that the more subjective side of medical work should have as much attention as the objective, and that the integration of mind and body should be in the forefront of medical practice. It is really a question of undergraduate training. Every successful general practitioner knows that that must be so, and the articles in this book written by Hopkins, Todd, and O'Neill respectively make that position abundantly clear. Todd emphasizes the position especially when he points out that the most ordinary case with the most ordinary signs and symptoms can still be an interesting person. The accurate recognition of the person back of the disease is the important issue. The doctor who knows that is the one who will obtain real satisfaction out of his work and will be of immeasurable help to those who consult him.

While this book serves an important purpose, yet it could easily have reached a much higher level. It is very uneven in its presentation. Some chapters can be highly recommended; others have little or no justification for their inclusion. It seems almost as if a certain amount of needless padding had been indulged in. The editor might, in case of another edition, give serious consideration to a reconstitution of this volume.

D. K. HENDERSON.

RORSCHACH TESTING

Psycho-analytic Interpretation in Rorschach Testing: Theory and Application. By Roy Schafer, Ph.D. (Pp. 446+xiv. $8.75.) New York: Grune and Stratton. 1954.

To psychologist and psycho-analyst alike it is a truism that the value of any psychological test depends on the degree to which it is capable of correlation with a coherent theory of mental function. To which generalization the psycho-analyst naturally adds, *ex parte*, that the quiddity of psychological data, whether these be gathered from spontaneous introspections or, as in the Rorschach test, evoked by the application of set stimuli, can be appreciated only after they have been interpreted, preferably by a Freudian. It was in fact inevitable that the Rorschach test, which at first had only slender association with psycho-analytic thinking, should sooner or later be correlated with Freudian theory.

Dr. Schafer has made a conscientious attempt to effect this correlation. Starting with a careful survey of the "test situation" from both subjective and objective standpoints, he examines the "response process," "thematic analysis," and the criteria for judging the adequacy of interpretations. Having produced a mainly psycho-analytical classification of themes and variations, he then proceeds to examine the Rorschach test in terms of the psycho-analytical concept of mental "defence" and considers in series the processes of repression, denial, projection, and "obsessive-compulsive" mechanisms.

The book is one that calls for a specialized knowledge of both the Rorschach and the Freudian approach—a fact which might seem to limit its appeal to general clinicians. Despite this disadvantage it can be read with profit by those—and there are many—who have recourse to the test without knowing very much about it. Its main flaws are a verbosity which, in the case of terminology, borders on verbigeration, and, despite the assurances of the author, a rather naive belief that modern psycho-analytical constructs (narcissism, for example) are adequately defined. Incidentally some important, if rather diffuse, psycho-analytical concepts—for example, "introjection" and "sublimation"—have been left severely alone; and there are no parallel (control) correlations with other theories of mind. Perhaps some Jungian will remedy this omission.

EDWARD GLOVER.

TUMOURS OF LYMPHOID TISSUE

Tumours of Lymphoid Tissue. By George Lumb, M.D. Foreword by Sir Stanford Cade, K.B.E., C.B., D.Sc., F.R.C.S., M.R.C.P., F.F.R. (Pp. 203+viii; illustrated. 37s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This monograph is based on a clinical and pathological study of 410 patients with primary tumours of lymphoid tissue seen at the Westminster Hospital between 1940 and 1952. The tumours are classified under the headings follicular lymphoma, lymphosarcoma, reticular lymphoma, Hodgkin's disease, reticulum-cell sarcoma, and anaplastic tumours of lymphoid tissue, and the pathology of each is described along conventional lines, with special emphasis on the natural history of the disease. Chapters are included on problems of diagnosis and the effects of therapy, and 19 illustrative case histories are given in detail.

This is a simple and straightforward account of a difficult subject, but it says nothing that has not been said before. The many tables are unnecessarily bulky, and some of them could with advantage be omitted and their contents included in the text. The book is lavishly illustrated; 84 whole pages are devoted to illustrations, as well as many half-pages. While most of the photographs are excellent, some—notably Figs. 9 and 11, 1, 2, 3, and 4—are poorly defined. There is much unnecessary repetition in the illustrations; in the chapter on Hodgkin's disease, for example, there are six very similar photomicrographs of abnormal reticulum cells and three of fibrosis in a gland. In the chapter on effects of therapy there are four illustrations of collagen formation in a gland; and in the section on problems of diagnosis nine illustrations from the case of torulosis previously described by Galton and Whittick seems excessive. The index consists largely of a list of chapter headings and subheadings, and omits many of the subjects mentioned in the text.

If Dr. Lumb has added nothing new or original to our knowledge, we should at least be grateful that he does not still further confuse it.

W. GOLDIE.

CRIME COMICS AND JUVENILE DELINQUENCY

Seduction of the Innocent. By Fredric Wertham, M.D. (Pp. 397+x; illustrated. 21s.) London: Museum Press Ltd. 1955.

The traffic in crime comics in the United States has grown rapidly in recent years. In 1947 they represented about one-tenth of the total of all comic books, in 1949 one-third, in 1954 "the vast majority." About 90 million copies are now sold every month, and a million dollars a week are taken from the pockets of children. Copies pass from hand to hand in a brisk second-hand trade and are read by many children. Dr. Wertham estimates that the average American child reads over 14 comic books a week. The publishers, usually subsidiaries of big firms, constantly change their names and are, in effect, anonymous.

The trade is horrifyingly evil. Turning over the 16 pages of photographic reproduction in Dr. Wertham's book, one sees baseball played with a man's head; a close-up of the face of a hanged man (cover picture); two men tied to the back of a speeding car, their faces being "erased" in the grit; a girl screaming while her right eye is held open and a hand approaches it with a stiletto. Advertisements offer the child, for money sent through the post, switchknives, throwing knives, pistols shooting steel darts. To quote the author, "The cover of the comic book draws the child's attention to a crime, the text describes one, the pictures show how it's done, and the advertisements provide the means to carry it out."

It would seem self-evident that such a pabulum must have a debasing and demoralizing effect. This is, however, not the established psychiatric view in the U.S.A. Psychiatrists of repute can be hired by publishers to endorse the harmlessness of their products; and the child-guidance experts think the causation of juvenile delinquency is so complex that it would be altogether too "simple" to suppose that crime comics had anything to do with it. Psycho-analysis teaches us that the foundations of personality are laid down in the first six months, so that by the time he comes to read these books the child is already predestined to delinquency or to sanity.

Dr. Wertham's book is all too readable, and should be widely read; but it is not a satisfactory presentation of his powerful case. Facts and arguments are not marshalled in an orderly way, and the book badly needs a good index.

ELIOT SLATER.

Though he has seen much of the world, Dr. Harry R. Lillie reserves his most cordial enthusiasm for the glittering wastes of the polar regions in *The Path Through Penguin City* (Ernest Benn, 25s.), and he succeeds in communicating to the reader his love of the animals that are too often slaughtered there with needless or careless cruelty. "Whaling and sealing, written and talked about in the past as sagas of heroism and adventure, I had found to be largely sagas of brutality." His story makes a curiously personal travel book. Against a background of unusual voyages and places, the description of which he supplements with clear photographs, he sets his forceful plea for more kindness in man's treatment of wild animals. Certainly many medical men could only regard as abhorrent the manner in which the commercial exploitation of whales and seals is sometimes carried on. The author has himself had some success in encouraging the whalers to adopt more humane techniques, though the problem of excessive fishing has not been solved.

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PROGNOSIS IN CANCER OF LARGE INTESTINE

In England and Wales in 1953 cancer of the large intestine caused 15,395 deaths.[1] Cancer of the rectum was responsible for 5,676 of this total, or 1 out of every 90 deaths from all causes, and cancer of the colon for 9,719, or 1 out of every 52. Figures obtained by the General Register Office show that, of the cases of cancer of the rectum registered in 1945 and 1946 at their initial hospital attendance, only 11% of the males and 17% of the females are alive at the end of five years. For cancer of the colon the comparable figures are 10% and 14%. Referring to the prognosis of cancer of the large bowel in the population of Detroit, D. A. Cameron, H. A. Chapnick, and D. W. McLean[2] conclude their analysis by stating: "Our study indicated that out of every 100 admissions for cancer of the large bowel 40 patients will leave hospital presumably cured, but only 15 will be alive and well five years later." These two series of statistics, the one concerning a population of 44 millions on this side of the Atlantic and the other one of over 1½ millions on the other side, are strikingly similar and represent the true overall prognosis of the disease.

Many workers have recorded the prognosis in operated cases which, since secondary deposits were absent from the liver, the surgeon had hoped to cure. Typical of the larger series is that of R. S. Grinnell,[3] in the U.S.A., who analysed 521 such cases of cancer of the colon and 366 of cancer of the rectum. Of the colon cases 45.5% were alive at the end of five years (operative deaths being taken into account) and of the rectum cases 46.4%. On separating the survivors into those whose lymph glands were involved at the time of operation and those who had no metastases, the survival figures were approximately 37% and 68% for both cancer of the colon and cancer of the rectum. In Britain Gabriel's figures[4] for the rectum of approximately 34% and 68% are closely similar. These figures suffice to show that the prognosis of cancer of the large intestine is lamentably poor and that the results of surgery depend largely for their success on the absence of affected lymph nodes at operation, or, if they are involved, on the possibility of their excision.

How may the prognosis be improved? First, by earlier diagnosis. In the anaplastic type of growth the lymph nodes may be infiltrated while the primary is still small and has only recently caused symptoms. At the other end of the scale, in the case of well-differentiated cancer, the lymph nodes may not be involved in spite of the fact that the growth is bulky and has caused symptoms for many months. Nevertheless these types of case are in the minority and in most the presence of metastases seems directly related to the duration of the symptoms of the disease. Diagnosis may be delayed by the patient not consulting his doctor when symptoms first appear or by the doctor not appreciating the significance of the symptoms and such signs as may be present. Since one out of every six deaths are attributable to cancer of all types, it is surely time the public were better informed about the early symptoms of the disease, for only thus can the main source of delay be reduced. The second source should serve as a challenge to the teachers at undergraduate hospitals. The earliest symptoms, not only of cancer of the large intestine but of all cancers, are perhaps apt to be forgotten by students because of the emphasis often placed on surgical technique and the biochemistry of post-operative care. Too little time is still spent at the bedside and too much in the operating-theatre. It is an unfortunate fact that in a series reported by S. O. Aylett[5] 30% of cases of cancer of the rectum experienced an average delay of three months between first attendance on the doctor and reference to hospital. This delay would be minimized if, in particular, alterations of bowel habit, however small, and minor bleedings, even in young patients, were always thought of as being due to cancer of the large intestine until this cause was disproved by further investigation—and if a rectal examination was carried out in all such cases.

Developments in surgical techniques have their part to play in improving the prognosis of cancer of the large intestine. In 1938–9 the resectability rate of cancer of the colon was, according to the British Empire Cancer Campaign's figures, only 34.8%. In a series operated on between 1945 and 1953 by various surgeons and reported by Lawrence Abel at the combined meeting of the Association of Surgeons and the American College of Surgeons in the summer of 1954 the resectability rate was 67.3%. While the

[1] *Registrar-General's Statistical Review of England and Wales for the Year 1953*, Tables, Pt. 1, Medical, 1954, H.M.S.O.
[2] Cameron, D. A., *et al.*, *Arch. Surg. (Chicago)*, 1954, **69**, 242.
[3] Grinnell, R. S., *Surg. Gynec. Obstet.*, 1953, **96**, 31.
[4] Gabriel, W. B., *The Principles and Practice of Rectal Surgery*, 1948, London.
[5] Aylett, S. O., *Practitioner*, 1949, **162**, 502.
[6] Deddish, M. R., *Proc. roy. Soc. Med.*, 1950, **43**, 1075.
[7] Ault, G. W., *et al.*, *Surg. Gynec. Obstet.*, 1952, **94**, 223.
[8] Grinnell, R. S., and Hiatt, R. B., ibid., 1952, **94**, 526.
[9] Gollgher, J. C., *Brit. J. Surg.*, 1954, **168**, 351.
[10] Aylett, S. O., *Surgery of the Caecum and Colon*, 1954, Edinburgh.
[11] Wangensteen, O. H., *et al.*, *Surg. Gynec. Obstet.*, 1954, **99**, 257.

resectability rate had nearly doubled, the operative mortality had been halved from 18.3% to 9.2%. These latter figures will probably be improved on again with recent advances in pre- and post-operative care and anaesthetic and operative techniques, permitting a more favourable prognosis. Many authors have drawn attention to the need for the widest possible excision of the areas of lymphatic drainage in treating cancer of the large intestine.[6–10] These extensive operations, when carried out on reasonably fit patients by surgeons trained in colonic surgery, have a low mortality rate and should help to improve the prognosis. Another recently developed surgical concept is the "second look" procedure described by O. H. Wangensteen.[11] He advocates, in those cases in which at the first operation lymphatic metastases are found, reopening the abdomen six months after the initial excision. If the disease has recurred, resection is again carried out, and the abdomen is explored at six-month intervals until one operation is completed at which no cancer is discovered. It may certainly be a procedure worth undertaking for those cases in which the pathological examination of the specimen excised at the first operation shows lymphatic involvement as far as the ligature round the main vascular pedicle. The prognosis in this group of patients is particularly poor, and in Gabriel's series only 11% were alive at the end of five years. Earlier diagnosis and the most radical excisions undertaken by surgeons trained in colonic surgery offer at present the only hopes of diminishing the high mortality of this disease. Both hopes are, with high endeavour, attainable.

TREATMENT OF TUBERCULOUS MENINGITIS

A recent leading article in a contemporary on tuberculous meningitis contained the statement, "attempts to eliminate intrathecal therapy—are justified only if undertaken cautiously in specialized units."[1] Dr. Douglas Hubble[2] later contested this, referring to treatment without intrathecal injections as "nearly universal practice." No one will deny the introduction of isoniazid has greatly improved the prognosis in this disease, but it is only about three years since it was first generally used, and a survey of the experience gained is appropriate at this stage. There has been some diversity in the methods used, and it is interesting to see how the results and conclusions bear on the difference of opinion to which we refer.

Clark and his colleagues[3] contributed the first enthusiastic report on the effect of isoniazid in both meningeal and miliary tuberculosis. Many of their patients were Navajo Indians: fifteen had meningitis, and with the exception of two of them, who at one stage had intrathecal streptomycin, they were given either isoniazid alone or isoniazid and intramuscular streptomycin. It is now generally believed that treatment with any single drug is a mistake, but Appelbaum and Anderson[4] report 7 recoveries in 10 cases treated only with isoniazid or iproniazid (1-isonicotinyl-2-isopropyl hydrazide). Torres-Gost,[5] of Madrid, reported on an unusual method of treatment in 100 patients, among whom there had been only six deaths: this was intramuscular streptomycin together with both oral and intrathecal isoniazid. An accompanying paper by Fletcher[6] reports that oral administration of isoniazid produces adequate concentrations of the drug in the cerebrospinal fluid, and it thus seems clear that intrathecal administration of this drug is superfluous.

Intrathecal administration of streptomycin, despite the advent of isoniazid, has been continued in several centres in Great Britain. Anderson and his colleagues[7] treated seven patients, all of whom survived, one being given isoniazid only and the remainder also both intramuscular and intrathecal streptomycin, in four for only one week and in two for four weeks. Lorber[8] gave streptomycin by both routes to 22 patients, of whom 12, with 11 survivals, also received oral isoniazid, and 10, with 8 survivals, did not. The former group needed fewer intrathecal injections, the average being 65, whereas in the group not receiving isoniazid it was 90. Lorber discussed the necessity for intrathecal streptomycin, and, having failed to find any record of a comparative trial of treatments with and without it, decided that there was insufficient evidence to justify its abandonment. The series of 60 patients at the Hospital for Head Injuries at Oxford described by Taylor[9] is larger, and the verdict from such a source that "intrathecal streptomycin is considered to be the *sine qua non* of satisfactory therapy" must command respect. On the other hand, this paper does not discuss any improvement which may have resulted from the introduction of isoniazid, or indeed even state the number of

[1] *Lancet*, 1954, **2**, 797.
[2] Hubble, D., ibid., 1954, **2**, 1076.
[3] *Amer. Rev. Tuberc.*, 1952, **66**, 391.
[4] *J. Amer. med. Ass.*, 1954, **156**, 673.
[5] *Lancet*, 1953, **2**, 693.
[6] Ibid., 1953, **2**, 694.
[7] Ibid., 1953, **2**, 691.
[8] Ibid., 1954, **1**, 1149.
[9] *Tubercle* (*Lond.*), 1954, **35**, 126.
[10] *British Medical Journal*, 1953, **2**, 1127.
[11] *Amer. J. Dis. Child.*, 1954, **87**, 273.
[12] *Amer. Rev. Tuberc.*, 1954, **69**, 192.
[13] Ibid., 1954, **69**, 370.
[14] *Proc. Mayo Clin.*, 1953, **28**, 381.
[15] *Transactions of the 13th Conference on the Chemotherapy of Tuberculosis* 1954. Veterans Administration, Washington.

patients to whom this drug was given: it is concerned rather with the improvement in results attributed to intrathecal tuberculin.

A number of other authors have either reached or incline to the opposite conclusion. Bulkeley,[10] of Durban, having treated in a variety of ways a long series of patients, nearly all children, finally adopted as a standard treatment intramuscular streptomycin with oral isoniazid and P.A.S., together with A.C.T.H. to prevent arteritis and the formation of organizing exudates. The last 17 patients in the series received this treatment, and among them there have been three deaths. It is stated that "intrathecal streptomycin is now a thing of the past in this hospital." Waddell and his colleagues[11] contrast the poor results previously obtained in children with those now given by intramuscular streptomycin and oral isoniazid and P.A.S., but the number of cases they treated was small. Spies and his colleagues[12] present a similar contrast on a larger scale: of their 61 pre-isoniazid patients only 11 survived, but of 26 treated with isoniazid 14 have survived. Half of this group were also given streptomycin by both routes, but the survivors were equally divided between these and the remainder. Spies *et al.* think it "likely that the penetration of isoniazid into the cerebrospinal fluid . . . will obviate the necessity for intrathecal streptomycin therapy in the future." Fitzpatrick,[13] on the other hand, reached and acted on this conclusion some time ago; of four systems successively used in treating his series of 46 patients at Denver, the last and most successful consisted of oral isoniazid and P.A.S. and streptomycin by the intramuscular route only. He notes that the cerebrospinal fluid became normal during this treatment after an average of 6.1 months, compared with 11 months or more after all previous forms of treatment. An author who also commends this system of treatment, but without citing clinical evidence in support of it, is B. E. Douglass,[14] of the Mayo Clinic. Perhaps the most striking, because graphically presented, evidence of the altered outlook in this disease is that furnished by the large-scale Veterans Administration study in the U.S.A.[15] In the graphs of survival of 287 cases given four different systems of treatment, that for "isoniazid in combination" soars above all the rest. Most of the 8 deaths in the 39 patients so treated occurred early. It was elicited in the discussion on these findings that only 6 of these 39 patients were given streptomycin intrathecally. This is perhaps the most solid piece of evidence that the intrathecal injection of streptomycin may no longer be necessary, but the weight of other published American opinion also seems to favour this view.

SALICYLATE INTOXICATION IN CHILDREN

Salicylates have long been used in the treatment of acute rheumatism, and their toxic qualities are well understood. Lees,[1] who was one of the first to recommend large doses of sodium salicylate in the treatment of rheumatic fever—he prescribed 180 gr. (12 g.) daily—recognized in 1903 that hyperpnoea was the important symptom indicating intoxication. This hyperventilation was assumed to be due to acidosis, but Graham and Parker[2] in 1948 showed that it was the result of reflex stimulation of the respiratory centre by the high concentration of salicylate in the plasma, and therefore that its first biochemical sequel was a respiratory alkalosis. The kidney then allows bicarbonate to escape, while retaining chloride; so the plasma bicarbonate falls and plasma chloride rises.[3] In those suffering from intoxication by salicylates alkalosis is therefore the first state, and acidosis the second but not final state if treatment is prompt and correct.

Accidental aspirin-poisoning apart, salicylate intoxication would probably be a rarity if Coburn[4] had not suggested that it was necessary to achieve a salicylate level of 35–50 mg. per 100 ml. of plasma in acute rheumatism in order to obtain optimal therapeutic results. Subsequent investigations have established that, if blood concentrations of this degree are to be maintained, many patients will be poisoned. For example, Holt,[5] in treating 52 children with acute rheumatism, tried to keep the concentration of salicylate at 30–40 mg. per 100 ml. of plasma, and 17 of his patients developed hyperpnoea. He concluded from this experience that if children are to be treated with salicylates in high dosage admission to hospital will usually be required. The question then immediately arises: are smaller doses of the drug and lower amounts of salicylate in the plasma equally effective in the treatment of acute rheumatism? The same group of Sheffield paediatricians[6] has done something to answer this question. Acute rheumatism in 10 children treated by high doses of salicylate remitted in an average of 39 days, and a similar group treated with much smaller doses of salicylate remitted in an average of 50 days. The dose of salicylate was 1½ gr. (100 mg.) per lb. (0.45 kg.) of body weight—say, 60–120 gr. (4.8 g.) daily—in the

[1] *British Medical Journal*, 1903, **2**, 1318.
[2] *Quart. J. Med.*, 1948, **17**, 153.
[3] Singer, R. B., *Medicine (Baltimore)*, 1954, **33**, 1.
[4] *Bull. Johns Hopk. Hosp.*, 1943, **73**, 435.
[5] *Lancet*, 1954, **2**, 1144.
[6] Holt, K. S., ibid., 1954, **2**, 1197.
[7] *Textbook of Paediatrics*, edited by Nelson, W. E., 1954. Philadelphia.
[8] Joint Report Medical Research Council and American Heart Association, *British Medical Journal*, 1955, **1**, 555.
[9] Heymann, S., Javett, S. N., and Rudolph, A. M., *S. Afr. med. J.*, 1954, **28**, 1092.

first group, and only 20–30 gr. (1.3–2 g.) daily in the second group. Would a more moderate commencing dose of 1 gr. (65 mg.) per lb. of body weight per day —say. 40–80 gr. (2.5–5 g.) daily—with a gradual reduction in dosage after two days, as usually recommended,[7 8] achieve an optimal result with a negligible risk of intoxication ? This is as yet uncertain, but it would be as well not to exceed this dosage as a general rule nor to neglect the first appearance of hyperpnoea.

Since acute rheumatism is uncommon under the age of 4, and aspirin is not a drug which is much used in this country either in the treatment of disease or for the relief of pain in the very young, therapeutic salicylate poisoning in infancy is rare. This is fortunate, for South African experience[9] suggests that infants are especially liable to salicylate poisoning. In one year 15 infants were admitted to a Johannesburg children's hospital suffering from therapeutic salicylism, and 7 of them died. Two circumstances appeared to have enhanced the toxic properties of the salicylate. The children were usually suffering from pyrexial diseases likely to be accompanied by oliguria ; and most of them had received a sulphonamide–aspirin mixture which was at that time (1951) a popular prescription in South Africa, and the sulphonamide may itself have interfered with renal tubular function. No similar mixture has been widely used in this country (it was popular in Sweden in 1947), and the cases of salicylate poisoning in infants admitted to hospitals in Britain are usually the result of accidental ingestion of the drug. The South African report is a reminder that aspirin has little place in the treatment of sick infants.

Gastric lavage should be used promptly in treatment if a large single dose has been taken ; if the child's condition is not serious, this, and a high fluid intake, may be sufficient. Intravenous fluids will be required if the child is ill, both to ensure the rapid elimination of the drug through the kidney and to correct electrolyte disturbances. Heyman and his colleagues[9] recommend that Ringer lactate solution should be used for intravenous infusion, followed by 5% dextrose–water solution. In one patient an exchange transfusion was probably life-saving, and the level of salicylate in the blood was reduced by this means from 53 mg. to 28 mg. per 100 ml.

INSECTICIDE VAPORIZERS

One advantage of the English climate, especially in a summer such as we experienced in 1954, is that flies are rarely such a nuisance as they are in warmer lands. Less fortunately, perhaps, standards of hygiene are not so high as they should be, and access to food by flies is often lamentably easy. In many parts of the U.S.A. warm summers encourage fly breeding, and this fact, coupled with a higher general awareness of the risks of poor hygiene, has inspired a more concerted attack on flies at as many points as possible. Active sales-promotion methods there have led to the widespread use of insecticide vaporizers, and they are also on sale in Britain. The principle of these devices is the volatilization of substances like D.D.T. or, more commonly, gamma B.H.C. (lindane). The solid insecticides are vaporized from some heat source which may or may not be thermostatically controlled to regulate the rate of evaporation. Such devices are intended to maintain a constant concentration of insecticide in the air, though this is difficult in a normally ventilated room, where the air may change completely from five to several hundred times a day. Much of the insecticidal effect of the vaporizers is probably due to residues which they deposit on adjacent parts of walls and ceiling. Indeed, there seems to be little evidence that these machines, even if operating under optimum conditions, are more effective in killing flies than residual films of insecticide deposited by spraying. Nevertheless the idea of a continuous, virtually effortless control of flying insects in closed spaces by means of these vaporizing devices has obviously made an appeal in the U.S.A. that has led the public health authorities to feel considerable concern about the possible health hazards incurred. The A.M.A. Committee on Pesticides has issued three warnings within three years about the dangers from these machines.[1–3] An interdepartmental committee on pest control laid down performance standards for acceptable machines. The maximum output should not exceed 1 g. per 15,000 cubic ft. (425 cubic m.) per 24 hours, which gives a concentration of about 0.2 mg. per cubic metre. The committee noted that few machines conformed to what was considered to be a reasonably safe design. It has been observed that a vaporizer adjusted to emit 1 g. per 24 hours varied from ¼ to 2½ g. according to prevalence of local air currents.[4] They advised against their use in private houses or in premises where food was prepared or eaten. Exposed food can pick up 0.1–1 p.p.m. gamma B.H.C. each day of exposure in rooms where the vaporizers are used.

The Pesticides Committee has had its attention drawn to a number of cases of illness attributed to exposure to these vapours. Most are cases of irritation of the eyes and respiratory tract and dermatitis. Their occurrence clearly illustrates the selection of the few hypersensitive individuals from a large exposed population. More questionable is the association between a case of peripheral neuritis, one of anuria, and several of anaemia with exposure to these insecticides as vapours. Although gamma B.H.C. is generally regarded as relatively non-toxic, the committee records the case of a baby having convulsions within an hour of swallowing a tablet of gamma B.H.C., giving a dose

[1] *J. Amer. med. Ass.*, 1952, **149**, 367.
[2] Ibid., 1953, **152**, 1232.
[3] Ibid., 1954, **156**, 607.
[4] Spear, P. J., *Soap*, 1952, No. 8, 147.
[5] McNamara, P. B., and Krop, S., *J. Pharmacol.*, 1948, **92**, 140.

equivalent to 45 mg. per kg. But, if relatively non-toxic by mouth, gamma B.H.C. is very toxic when injected intravenously, and a dose of 5 mg. per kg. will cause convulsions in dogs.[5] Inhalation of the vapour of gamma B.H.C. obviously more nearly approximates to an intravenous than to an oral route of administration. Reference is made in the A.M.A. Committee's report to observations that rats are affected by the continuous inhalation of 0.7 mg. of gamma B.H.C. per cubic m. of air seven hours a day for months and that the compound can accumulate in the brain.

Whether or not the use of these devices presents a real hazard to the majority of healthy people exposed to them, the hypersensitive minority are clearly going to suffer. In the absence of any good evidence of their value in insect control—an absence that may account for some of the sales-promotion methods used in America—it is to be hoped that their use will not become widespread in Britain. The prevention of breeding is the most satisfactory method of insect control when it can be effectively carried out. All flying insects alight sometimes, and the insecticide should be selectively deposited in such places by spray or a more permanent type of application. Widespread diffusion in the air of probably ineffective concentrations of insecticide is followed by a haphazard distribution of the condensed solid in the vicinity of the vaporizer.

ISONIAZID AND PYRIDOXINE METABOLISM

After the introduction of isoniazid for the treatment of tuberculosis, many workers reported that prolonged administration of the drug gave rise to unpleasant side effects, some of which resembled those due to vitamin deficiencies. Thus J. S. Pegum[1] described a patient who suffered from the "burning feet" syndrome after treatment with isoniazid, suggestive of a pantothenic acid or nicotinic acid deficiency. R. B. McConnell and H. D. Cheetham[2] refer to a patient receiving the drug who developed acute pellagra, and who recovered on treatment with the vitamin-B complex. During studies on the effect of high doses of isoniazid J. P. Biehl and R. W. Vilter[3 4] noted that peripheral neuritis was a fairly common side effect, occurring in about 40% of their patients. The similarity of the neuritis to that caused by the pyridoxine (vitamin B_6) antagonist, desoxypyridoxine,[5] led them to investigate pyridoxine metabolism in tuberculosis patients receiving isoniazid. Seventy-four patients were given isoniazid in doses ranging from 6 to 24 mg. per kilogram of body weight a day for periods of two to twelve months. The incidence of peripheral neuritis was greatest in those patients receiving the higher doses of the drug. Those given the standard dose showed no symptoms until six months had elapsed, but patients on high doses frequently developed neuritis in five weeks. When the isoniazid was withdrawn, symptoms disappeared in a few weeks, although residual effects persisted for a year or more in those patients receiving treatment for more than a few weeks after the onset of symptoms. When pyridoxine was given with large doses of isoniazid, neuritis did not appear, although it did in 40% of the patients receiving isoniazid without pyridoxine. It is of considerable interest that this drug-induced neuritis has not been reported in children or monkeys receiving high doses of isoniazid.

Biehl and Vilter followed the effect of the drug on pyridoxine and nicotinic acid metabolism by examining the urinary excretion of pyridoxine, pyridoxic acid (an inactive metabolite), and N′-methylnicotinamide, which is the normal excretion product of nicotinic acid. They also tested for pyridoxine deficiency. Since pyridoxine is essential for the normal metabolic breakdown of the amino-acid tryptophan, a deficiency of pyridoxine results in an abnormal breakdown of tryptophan to xanthurenic acid. Biehl and Vilter therefore gave test doses of tryptophan and interpreted the appearance of xanthurenic acid in the urine in high quantities as a sign of pyridoxine deficiency. After high doses of isoniazid the excretion of pyridoxine and xanthurenic acid was increased, but that of pyridoxic acid and the nicotinic acid metabolite was normal in all patients. The pyridoxine did not interfere with the antituberculous activity of the isoniazid. J. Ungar and his co-workers[6] have shown that the toxic effects of isoniazid in mice, manifested by retardation of weight and involution of the testes and thymus, can be prevented by pyridoxine, which does not interfere with the antituberculous activity of isoniazid *in vitro* or *in vivo* in mice.

It has been assumed that isoniazid exerts an antivitamin effect by blocking the action of nicotinic acid and pyridoxine by competitive inhibition, just as the sulphonamides block the action of *para*-aminobenzoic acid.[1] Biehl and Vilter do not accept this view. They consider that isoniazid depletes the tissues of pyridoxine, and so causes a deficiency of this vitamin by the formation and excretion of the isonicotinyl hydrazone of pyridoxal, the formation of which can be demonstrated in the test-tube. If this explanation is correct, is it possible that other drugs with a hydrazide grouping, such as hydralazine (apresoline), might behave in a similar way?

[1] Pegum, J. S., *Lancet*, 1952, **2**, 536.
[2] McConnell, R. B., and Cheetham, H. D., ibid., 1952, **2**, 959.
[3] Biehl, J. P., and Vilter, R. W., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, **85**, 389.
[4] *J. Amer. med. Ass.*, 1954, **156**, 1549.
[5] Vilter, R. W., *et al.*, *J. Lab. clin. Med.*, 1953, **42**, 335.
[6] Ungar, J., *et al.*, *Lancet*, 1954, **2**, 220.

HEART BEATS OFF THE MAINS

Treatment of the syncopal attacks of Stokes–Adams disease presents difficulties, especially when episodes of cardiac arrest become frequent and severe. Zoll and his colleagues[1] have used an external cardiac pacemaker to maintain adequate cardiac contractions until spontaneous ventricular rhythm reappeared. This instrument produces monophasic, rounded electric impulses, with an average duration of 2 to 3 milliseconds. The frequency of the shocks may be adjusted from 30 to 180 stimuli per minute and the amplitude from 0 to 150 volts.

[1] *Circulation*, 1954, **9**, 482.
[2] *J. Amer. med. Ass.*, 1955, **157**, 444.

The cardiac pacemaker is attached to the patient by two leads, which are connected to circular chest electrodes so placed upon the chest that the current flows across the heart. The instrument may be operated either from the mains or from a battery. Zoll and his colleagues report its use in fourteen patients with Stokes–Adams disease. Their patients were mostly in the seventh and eighth decades of life and were brought into hospital because of increasingly severe and frequent attacks of cardiac arrest. Treatment by the cardiac pacemaker was given either for short periods in individual Stokes–Adams attacks or for more prolonged periods during frequently recurring attacks, stimulation being maintained sometimes for as long as one hundred hours. In all patients except one sustained beats finally reappeared and stimulation was then stopped. Adrenergic drugs were given simultaneously as required. Of the fourteen patients treated thirteen responded satisfactorily to the cardiac pacemaker and five had survived for about a year; but the remaining eight, although temporarily improved, died within a few weeks of treatment. In another recent report Douglas and Wagner[2] describe how a 72-year-old man who was having frequent Stokes–Adams attacks, finally becoming deeply comatose, recovered after seven days' continuous treatment with the cardiac pacemaker and was asymptomatic on leaving hospital. The cardiac pacemaker appears therefore to be useful, and indeed life-saving, during an exacerbation of Stokes–Adams disease, but it affects only slightly the final prognosis in the majority of these elderly patients. Troublesome complications of this treatment are painful contractions of the intercostal and pectoral muscles and irritation of the skin by the electrodes: pethidine or paraldehyde have been given to relieve discomfort.

It is possible that the external cardiac pacemaker may be of practical use in the immediate treatment of unexpected circulatory arrest during anaesthesia. The method has the advantage that it is safe and easily applied, and if circulatory arrest were due to ventricular standstill the cardiac pacemaker would probably resuscitate the patient. Should it fail, however, much valuable time would have been lost unless simultaneous preparations for an immediate thoracotomy had been made, so that cardiac massage could be carried out at once and, if necessary, electric defibrillation across the heart attempted.

ASSAY OF POLIOMYELITIS VACCINES

It is of paramount importance that methods of assaying a vaccine be standardized before it passes from experimental to general use, and the recent news from the U.S.A. that cases of paralytic poliomyelitis have been diagnosed following vaccination[1] has drawn attention to the need for strict control of biological products. An American public health officer is reported[2] to have predicted the "revival of the double and triple checking done in the Salk field trials last year."

The formolized poliomyelitis vaccine is an aqueous suspension of killed poliomyelitis viruses of Types I, II, and III in approximately equal proportions. In Britain manufacture is governed by the Therapeutic Substances Act, and tests for safety and potency are carried out, first by the manufacturer, and then by the Biological Standards Division at the National Institute for Medical Research.

The methods of assay and safety testing in general use (and they may be altered in the light of experience) can be considered under four main headings. First, tests are carried out for bacterial sterility, including *Mycobacterium tuberculosis*, before inactivation with formaldehyde. Secondly, tests for viruses other than poliomyelitis, particularly B virus and lymphocytic choriomeningitis virus, are performed by subculture into animals (rabbits and mice) and into tissue culture. Thirdly, and after inactivation, tests for live poliomyelitis virus are made by subculture into tissue culture. If these tests are satisfactory, the batches of vaccine made from each of the three types of virus are pooled, and more safety tests of the same kind are carried out on the pooled vaccine. At this stage special tests are made to detect minimal quantities of live poliomyelitis virus. Samples of vaccine are inoculated into monkeys and into tissue culture, which are then carefully observed for signs of infection, and histological examination of the central nervous system is carried out for minimal lesions of poliomyelitis infection. Fourthly comes the quantitative assay, the level of the immune response that a given vaccine batch will produce. Again, animal inoculations are necessary and the results are compared with those obtained with a reference or standard vaccine. Finally, a suitable preservative is added, and if all conditions are satisfied the product is released for use.

[1] *British Medical Journal*, May 7, p. 1144.
[2] *New York Times*, May 8.

GOLDEN JUBILEE OF THE "NURSING TIMES"

When the *Nursing Times* first appeared fifty years ago nursing was still a comparatively young profession, as distinct from a vocation or occupation, and there were still some years to run before the Nurses' Registration Act of 1919 established a General Nursing Council to make rules for the training, examination, and registration of nurses. The golden jubilee number of the *Nursing Times*, published last week, contains articles reviewing some of the changes which nurses have seen in the last fifty years, changes reflecting the technical advances in medicine as well as the political trend towards the welfare state. As the official journal of the Royal College of Nursing since 1926, the *Nursing Times* has played an influential part in improving the professional status of nurses and in advancing their education. It is a journal edited by nurses for nurses, though medical men and women have always been among its prominent contributors. Nurses are fortunate in having such a live and successful journal to keep them informed about the progress of their own profession and of the closely related profession of medicine, and we are glad to add our congratulations to the many received by the *Nursing Times* on its fiftieth birthday, a birthday most happily celebrated by a luncheon given last week by the publishers, Macmillan and Co., Ltd.

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EMERGENCIES IN GENERAL PRACTICE

ACUTE FOOD-POISONING

BY

CHRISTOPHER HARDWICK, M.D., F.R.C.P.

Physician, Guy's Hospital

Single cases and outbreaks of food-poisoning still occur with some frequency, especially in the holiday season. If the general level of personal and public hygiene was high enough no doubt these infections would cease, but it will be a very long time before this desirable state is reached. We must therefore continue to recognize and treat each case as it occurs.

Aetiology

The symptoms in all patients are very similar, but aetiologically two types can be recognized. In *toxic food-poisoning* the food is either poisonous in itself and is eaten by mistake, or the food is heavily contaminated by a poison, usually a bacterial toxin. Thus the toadstool fly agaric (*Amanita phalloides*) may be eaten instead of field mushrooms (*Agaricus campestris*), or the food may be infected with bacteria, especially staphylococci, which multiply and produce an exotoxin. Subsequent cooking may kill the bacteria but their poisons remain.

In *infective food-poisoning* the food is heavily infected by pathogenic organisms of the salmonella group, and it is the multiplication of these within the patient which gives rise to the illness. Typhoid and paratyphoid fevers come into this category, but as there is a long incubation period between the ingestion of the bacilli and the development of the disease they do not concern us here.

Protein is essential for bacterial growth, and so meat, fish, and milk are particularly likely to cause trouble. Sausages and any processed meats rightly have bad reputations as vectors of food-poisoning. Their preparation gives room for infection by cooks who may be carriers, and the mixing required makes it very easy for an unscrupulous maker to introduce cheap tainted meat into them. After they are made the sausages may only be smoked or very inadequately cooked before they are eaten. An outbreak of trichiniasis at the start of the second world war was attributed to the practice which was common amongst workpeople of a midland town of taking sandwiches to work which were filled with raw sausage-meat. Tinned foods did have a bad reputation, but with modern methods of canning the danger has largely gone; infection of the meat after a tin has been opened may, however, still occur. Recently duck eggs have come under a cloud; organisms of the salmonella group may infect the birds or may penetrate the eggs after they have been laid.

Symptomatology

Abdominal pain, vomiting, and diarrhoea occur in both types of food-poisoning. In the toxic form these symptoms may occur within a few hours of the food having been eaten. In the infective type some time must elapse before the bacteria, growing within the host, cause trouble, and so symptoms may be delayed for two or three days.

Although several people may have eaten the tainted food only one may develop symptoms of food-poisoning. The occurrence of the illness in a single member of a family does not therefore exclude the diagnosis. Children are particularly likely to be affected. Amongst adults those who have eaten the contaminated food on an empty stomach will suffer the worst. It is possible to see all gradations of the disease in the members of a family. The younger children may have a severe gastro-enteritis whilst the elder children may only vomit a few times. The parents may have a few hours of abdominal colic with one or two loose stools.

Vomiting is usually the first symptom. It occurs frequently and after a time streaks of bright blood may be brought up. Anything taken by mouth is immediately returned, and in a severe case the patient may become shocked and collapsed. The abdominal pain is colicky in nature and is usually situated in the centre of the abdomen. If vomiting is severe there will in time be soreness in the epigastrium. Similarly, when diarrhoea is frequent there may be pain and tenderness over the colon. Diarrhoea usually starts a little after these two symptoms. Frequent watery stools may be passed and in a severe case blood and mucus.

The general disturbance will vary in degree. It is usually most pronounced in children, but in a severe infection even adults may become acutely ill. The temperature rises to about 100° F. (37.8° C.), and there may be headache and pains in the limbs. Frequent vomiting and the passage of many watery stools can easily lead to dehydration. The patient's pulse rate rises, he becomes increasingly restless, and finally collapses with a rapid thready pulse, cold extremities, and ashen-grey colour.

Differential Diagnosis

When there is an outbreak of food-poisoning the diagnosis in each sufferer should not be difficult. In isolated cases, however, there may be considerable difficulty in diagnosis, particularly before diarrhoea has started. Acute intestinal obstruction and acute appendicitis must both be excluded. The rare possibility that the patient is not suffering from food-poisoning but from the effects of some irritant poison, such as arsenic, deliberately introduced in the food must also be remembered.

Outbreaks of bacillary dysentery, the infecting organism being *Shigella sonnei*, occur occasionally. Mental hospitals and, less often, children's homes still provide the bulk of these cases, but workers in such institutions may carry the infection to their homes. Adults are seldom very ill with Sonne dysentery, but babies and toddlers suffer severely.

Treatment

Acute food-poisoning may be of varying severity even though the patients are infected at the same time. For purposes of treatment it is useful to regard the cases as falling into two groups—mild or severe. Mild cases recover rapidly and need only symptomatic measures. Severe cases require urgent treatment, and the patient may die despite everything that is done for him. Such a division is not rigid, for a patient who is seen early may be thought to have only a mild infection, whereas a few hours later it may be obvious that the infection is severe.

Previously healthy adults will usually withstand even a severe attack of food-poisoning successfully. In elderly people, however, particularly if they have disabilities such as coronary atherosclerosis or nephritis, the outlook may not be so good and their admission to hospital may be advisable. This is also true for children, particularly below the age of 2 years. At this age the reserves of body fluids are small and the margin between hydration and dehydration is narrow. A few hours of vomiting may be enough to cause severe symptoms. If, therefore, the practitioner is is any doubt about the severity of an attack of food-poisoning in a child, it is best to recommend its immediate removal to hospital.

Mild Cases

Mild cases of acute food-poisoning recover most quickly if the patient is in bed. If there are children in the house-

hold, rest in bed should be insisted upon, especially if there is any suspicion that the infection might be dysenteric. A hot-water bottle, wrapped in a piece of flannel or put inside an old sweater, will relieve the abdominal pain. Despite his vomiting, the patient should take warm drinks as often as possible. These may consist of water, milk and water, or fruit juice with added sugar. An alkali which will not cause alkalosis, such as aluminium hydroxide or magnesium trisilicate in doses of 2 dr. (8 g.), will help if the gastritis is extensive. The former has the advantage that it is constipating and so will help to relieve the diarrhoea. Other mixtures which may be used include: mist. kaolin., *B.P.C.*, ½ oz. (14 ml.) four-hourly; or mist. kaolin. et morph., *B.P.C.*, ½ oz. 14 ml.) eight-hourly; this contains approximately 1/65 gr. (1 mg.) of anhydrous morphine. Mist. cret. aromat. c. opio, *B.P.C.*, ½ oz. (14 ml.) eight-hourly, is another useful mixture; this contains 10 min. (0.6 m.) of tincture of opium in each dose, which is equivalent to about 1/9 gr. (7 mg.) of anhydrous morphine.

Even though the headache and the generalized pains may be severe, aspirin is best avoided, for it is known to be a gastric irritant, especially when taken on an empty stomach. In its place Dover's powder (pulv. ipecac. et opii), 10 gr. (0.65 g.), may be given.

Severe Cases

In severe food-poisoning symptomatic measures will still be required, but, in addition, dehydration and shock as well as bacterial infection may have to be dealt with. Rest and warmth should be given, with full nursing care. The chalk and opium mixture will be required, to try to quieten the intestinal unrest. Owing to the excessive vomiting, feeding by mouth may be very difficult, but if possible the patient should be given small quantities of boiled water, to each pint (say half a litre) of which has been added ½ oz. (15 g.) of castor sugar and ½ dr. (4 g.) of salt.

Dehydration and the consequent shock are shown by a diminishing output of urine, a rising pulse rate, and a falling blood pressure. All these can be measured, so that the appropriate steps can be taken before the patient becomes grey and sunken, with cold extremities and delirium. Intravenous infusion will be required to replace the water and chlorides which have been lost in the faeces and the vomit. In the absence of laboratory facilities, a mixture of equal quantities of normal saline and isotonic glucose solution should be used, in quantities sufficient to enable the patient to pass a pint of urine in every eight hours.

Intravenous infusion is a rapid and effective way of restoring body fluids. It is, however, a very artificial method and both the quantity and the rate of infusion must be carefully controlled. When fluid is given by mouth the patient can regulate its absorption and excretion so that the circulation is not overloaded. When the intravenous route is used the volume of circulating fluid is immediately increased. If this goes too far, then the patient will become waterlogged, the heart will suffer, and his condition may be as bad or even worse than when he was dehydrated. This will be especially so in children, in whom the volumes of fluid required are less, and in old people, whose myocardium may be unhealthy.

It is impossible to give a definite figure for the quantity of fluid that may be needed. In a severe case 3 to 4 pints (1.5 to 2 litres) may have to be given as quickly as possible to combat the acute symptoms. Once these have been overcome the infusion can be given more slowly, say a pint (0.5 litre) every four hours. The aim should be to correct the acute symptoms and then to give the patient enough fluid to replace that lost during the previous 24 hours in the vomit, urine, and faeces, with the addition of 2 pints (1 litre) to make up for the fluid lost through the skin and lungs. As soon as the patient has ceased to vomit the infusion should be stopped and feeding by mouth begun again. Overloading of the circulation is shown by restlessness, increasing pulse rate, and finally by the appearance of moist sounds at the lung bases.

If the food-poisoning is of the toxic variety then chemotherapy can be of no help. If the disease is infective one of the sulphonamides which are poorly absorbed and which will remain in the intestine to deal with the salmonella organisms should be used. At least 18 g. of sulphaguanidine a day should be given: an initial dose of 6 g. and then 3 g. four-hourly for three or four days. If succinylsulphathiazole is used the dose can be less, but at least 10 g. should be given each day: an initial dose of 4 g., then 2 g. every four hours for four days.

Next article on Emergencies in General Practice.—"Severe Asthma," by Dr. A. Margaret C. Macpherson.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The volume contains 60 articles, all of which were revised by their authors for publication in the book. The first volume is now sold out and out of print. Copies of the second volume may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

Nova et Vetera

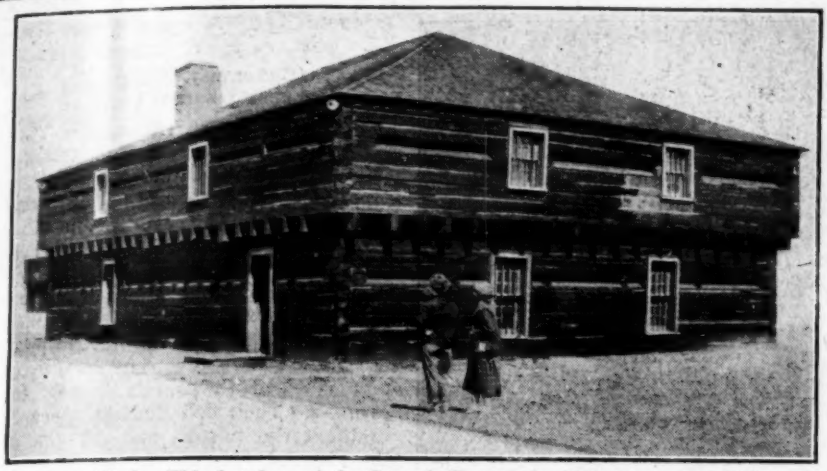
A POST-MORTEM POPULATION SURVEY FOR ARTHRITIS

Surveys to discover the incidence of certain disease groups in selected samples of the population are becoming increasingly popular, and an investigation of this kind was recently conducted in a Midland town to estimate the frequency of osteoarthritis. The unique opportunity has recently been taken of carrying out a survey for a similar purpose on the *skeletons* of the entire male population of the town and region of Visby, which is situated on the island of Gotland, off the coast of Sweden. The population in question was slaughtered by invading Danes in the year A.D. 1361, the bodies being thrown into a common grave, which was recently opened and examined by Dr. Bo. E. Inglemark, of the Department of Anatomy of the University of Upsala.

A detailed examination was made of the 1,085 skeletons which were found in this common grave at the site of the slaughter (later dignified with the name of a battle).* It was reported that "a good many morbid processes could be established in this material. Thus many of the vertebrae showed more or less pronounced spondylosis deformans," occurring mostly in the spines of middle-aged and elderly victims. Pott's disease was found in four cases, and some other joints were also found to have been the site of a tuberculous infection, and Dr. Inglemark gives a photograph of a knee-joint ankylosed as the result of this process. There also occurred "a fairly large number" of degenerative osteoarthritic joints. Hip-joints were affected in this way in 20 cases—"malum coxae senilis"—and one advanced case is illustrated. This disease had also occurred in about 25 cases in the elbows and wrist-joints. He points out that these people were obviously quite unfit for war service, and suggests that the cause of this rather high incidence of arthritic change may perhaps have been due to the hard work which they had to perform on the land, as they were mostly feudal peasants.

W. S. C. COPEMAN.

*Dr. Inglemark's findings are published as chapter 4 (pp. 149-209) of *Armour from the Battle of Wisby* (1939), vol. 1, by Bengt Thordeman.



Old Fort York. This fort housed the Queen's Rangers in 1793, when the building of Toronto was begun.

TORONTO, THE MEETING-PLACE

BY

S. S. B. GILDER, M.B., B.S., B.Sc.
Toronto

Tradition has it that the name Toronto comes from an old Indian word meaning a meeting-place. Here, at the mouth of the Humber River—now the site of the biggest traffic jams in the city—the red men coming south from Lake Simcoe met their brothers on the lakeshore trail. Here, close to a site now occupied in summer by an amusement park reminiscent of Blackpool or Southend, the French built a small fort in 1749, and called it Fort Rouille, in honour of the then Colonial Minister of France. When the Seven Years War brought English troops up from Fort Niagara, the tiny garrison burnt their fort and left the future site of Toronto to the wilderness and the Indians for the next twenty-five years.

Early History

With the close of the American War of Independence, thousands of United Empire Loyalists were expelled from the United States for their allegiance to King George III. From 1783 their migration northward into Nova Scotia and Quebec began, and it was an overflow from these who began the colonization of a new province known as Upper Canada and later as Ontario.

The site of Toronto, which lies on gently rising ground above a natural harbour, was evidently considered favourable for development, for in 1787 government agents negotiated with the Mississauga Indians for its purchase for a sum of £1,700 in cash and kind, thus obtaining a quarter of a million acres at a bargain rate. Oddly enough, the sale was not completed until 1805.

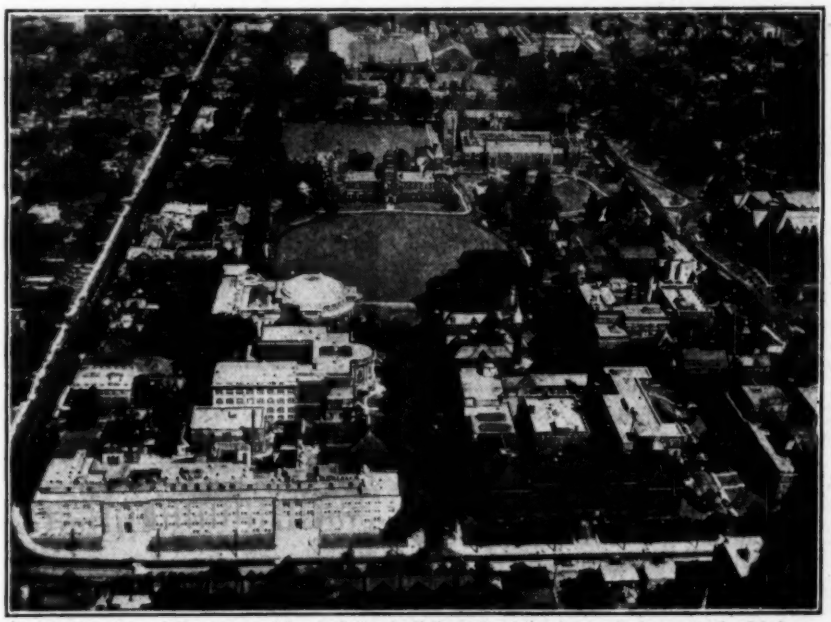
In 1788 Captain Gother Mann of the Royal Engineers was instructed to survey the area, and drew up a plan of the proposed town and harbour. Toronto has in fact been a planned city right from the start—there were 16 different plans in 66 years.

In 1793 Governor John Graves Simcoe, first Governor of the new province, came with his lady by lake to Toronto and said, "Here will be built a great city in the spring." The great city took much longer than that to materialize, but otherwise the command was obeyed to the full. At this point the new city was named York in honour of Frederick, Duke of York, who was then enjoying a sporadic success against the French. York it remained until 1834, when the little town incorporated all the small adjacent communities to form the city of Toronto.

Progress was slow at first. For two years there were only log cabins, and the first white baby was born only in 1800, but there was no major setback until April, 1813, when an American fleet of 14 sail came in and took and burnt the town after heavy fighting. In this engagement Dr. William Beaumont, the father of gastric physiology, served as surgeon to the Americans. At the end of July the Americans paid another brief visit, contenting themselves this time with burning a few buildings and looting stores.

From then on Toronto enjoyed a peaceful development until 1837, a year in which political feeling was running high between the Family Compact or Tory oligarchy and the reform party, whose Toronto leader was a former mayor, William Lyon Mackenzie. Mackenzie, an indifferent and indecisive commander, made an attempt to take the city in a rebellion doomed to failure from the start. He was outlawed for some years, but eventually returned from the States and ended his days in Toronto. The only significance of this rebellion is that it is still said to divide certain Toronto citizens whose ancestors took part on one side or the other.

From 1837 on, there was no major excitement in Toronto life. One author speaks of its enviable history and pictures the city "wearing with embarrassed rectitude the title of Toronto the Good." The focal points of city life seem to have been the churches, of which Toronto still possesses a phenomenal number. A Toronto historian, writing some 50 years ago, says: "The stern discountenance of any and every form of recreation [on Sundays] is said to be the cause of so many people going to church." The Sabbath is still kept to an extent now unfamiliar in England, in marked contrast to the rival city of Montreal.



The University of Toronto. Most of the buildings in this picture belong to the University, including the stadium in the background, behind which runs Bloor Street.

University Avenue, Toronto, leading up to the Parliament Buildings. Half-way up on the left is the Mount Sinai Hospital. Facing this is the Sick Children's Hospital, and further up the Avenue is the Toronto General Hospital.

We are left, then, with the picture of a solid, prosperous, conservative city of about the size of Birmingham and with an atmosphere of stability such as we associate with Edwardian England. But this atmosphere is rapidly changing. Recent years have brought in a flow of immigrants from all over Europe, so that the older predominantly Anglo-Saxon population, mentioned at the last B.M.A. meeting in Toronto in 1906, is now well diluted with other races. All the tongues of Europe are to be heard on the street-car, and there are a number of "colonies." On College Street there is a German sector; immediately west of this is a small Italian sector with two Italian cinemas. Around Spadina Avenue is a Hungarian colony; on Queen Street are the Poles, and up Bathurst Street the Ukrainians; on Elizabeth Street are the Chinese citizens.

What does all this imply? What sort of city is this to live and work in? Toronto lies in a climatically favoured part of Canada; winters are neither so severe nor so prolonged as elsewhere. From the business point of view, it is the capital of a province tremendously rich in agriculture and industry. The coming of the St. Lawrence Seaway will make it richer still. If its cultural and educational amenities were compared point by point with those of a city of similar size in the United Kingdom, Toronto would almost certainly emerge as victor. On the point of cleanliness it would win hands down.

Medicine in Toronto

In its early years the town depended on military surgeons for its medical care. The identity of the first civilian doctor is doubtful. A Dr. Glennon, "formerly at one of the finest colleges in Europe," started business in a baker's shop in 1807, but the first comer is usually acknowledged to have been an Edinburgh graduate, Dr. W. W. Baldwin, who found so little work to do that he doubled the parts of lawyer and physician, on one occasion interrupting his pleading to deliver a woman in labour. They were healthy folk in those days. A contemporary Toronto poet, A. J. Williamson, says:

> The doctor only pines an' dees
> For want o' wark in Canadie.

The first to practise full-time in York seems to have been the Hon. Christopher Widmer, the father of surgery in Upper Canada, who came in 1816 and had a finger in every pie. He and other ex-military surgeons from the medical schools of Edinburgh, Dublin, and London laid the foundations of medical practice in Toronto. Their first hospital, now the fine Toronto General Hospital, was started in 1820 with money originally intended to provide medals for loyalists. Their first students appeared in the early 'thirties, and the first of these qualified in medicine in 1836.

The history of organized medical education, and indeed of higher education in general, in Toronto is a complicated one. The University of Toronto, which always has been a provincial rather than a municipal university, began as King's College in 1843, as a result of the exertions of a formidable Aberdonian, Bishop John Strachan, who came to Canada as a Presbyterian schoolmaster and ended up as an Anglican Bishop, having founded a university, an English-pattern public school (Upper Canada College), and a cathedral *en route*. His Anglican University became secularized in 1849; but, nothing daunted, Bishop Strachan founded a rival establishment, Trinity College, in 1851, and this has remained true to the Anglican faith ever since. Visitors this year will have occasion to admire its lovely new chapel, at present under construction. By the 'fifties there were three medical schools, one for each of the universities and a third founded by a brilliant teacher, Dr. John Rolph, who had spent six years in exile for his assistance to Mackenzie in 1837. The resulting chaos was not sorted out completely until the final fusion of all existing establishments in 1903 to form the huge University of Toronto. This university's outstanding contribution to medicine was, of course, the discovery of insulin by Drs. Banting and Best. Their names are now commemorated in the Banting and Best Institutes

Sunnybrook Hospital, on the north-east fringe of Toronto, cares for sick veterans of the world wars.

The Royal York Hotel, the largest in the Commonwealth, where the conjoint B.M.A.–C.M.A. meeting will be held.

for medical research. The university medical faculty has all of the advantages to offer that could be found in any major school in the world. One unusual feature is a department of art as applied to medicine, for the training of medical illustrators.

The university occupies a central and spacious site in the city; it has many fine buildings, notably a gem of a Georgian hall of residence and Hart House, the finest academic club-house in North America, which has to be seen to be believed.

In Toronto, the counterpart of the Royal Society of Medicine is the Toronto Academy of Medicine, formed in 1907 by the fusion of four existing societies—the Medical Society, the Pathological Society, the Clinical Society, and the Ontario Medical Library Association. The Academy has the second best medical library in Canada (McGill, in Montreal, comes first) and a good auditorium, Osler Hall. It lies next door to the Medical Arts Building and close to the offices of the Canadian Medical Association.

The Sights

As Toronto grows, the number of shopping centres grows with it. The original main down-town shopping area lies close to the City Hall, an odd tall Victorian structure about which various opinions have been expressed. Here are the two rival department stores, Eaton's and Simpson's, across the street from each other, with a policeman controlling the surge of shoppers who rush across Queen Street from one store to the other. Why they do so is a mystery, since both stores seem to sell everything one could possibly want to buy. The main stem from this area north is Yonge Street, originally laid out by Governor Simcoe, and now roofing over Toronto's new and efficient underground railway. A mile or so north lies Bloor Street, at right angles to Yonge and just north of the university. If Yonge Street is the Oxford Street of Toronto, Bloor is the Bond Street, full of tempting little shops to delight the womenfolk.

The Royal Ontario Museum lies on Bloor Street, and is well worth a visit by even the most blasé. It is particularly strong in Chinese exhibits. The Art Gallery, opened in 1910 in The Grange, one of Toronto's older houses, is also recommended to visitors. It houses an interesting permanent collection, with good representation of Canadian artists, including the Group of Seven, who established a national school of painting. In addition, the Gallery is most progressive in arranging loan exhibitions. The highlight in 1955 has been the exhibition of paintings by Dutch masters, brought together from Europe and the U.S.A. The Public Library is excellent by any standards. It has a collection of Canadiana and the biggest circulation of foreign-language books to be found anywhere.

The historically minded will not fail to visit Old Fort York, down near the Exhibition Grounds, where it was established in 1793 by Governor Simcoe to protect a town that existed only in Captain Gother Mann's plans. A little to the west, along the lake-shore, lie the grounds of the Canadian National Exhibition, the largest annual exhibition in the world, held each year at the end of the summer. This is also the site of Fort Rouille, now marked only by a plaque. Across the harbour from the waterfront lies the Island, which is really a series of islands cut off from the mainland by east and west channels. This is a favourite spot for picnics, and a pleasant place to spend a peaceful time in. It can be reached by ferry from the waterfront.

No sight-seeing tour of Toronto would be complete without a visit to its fantastic twentieth-century castle, Casa Loma, perched on a hillside and about as incongruous a building as anyone could imagine. It is as if someone had dumped down a Moorish palace in Kensington.

Eating and Drinking

Gastronomes will have no difficulty in obtaining in Toronto the cuisine to which they are accustomed. A word about the drinking customs of the town may be helpful, however. It must be remembered that the battle for temperance rages more fiercely in Ontario than it has for many a year in Britain. To obtain spirits it is necessary to buy a liquor licence at a Government liquor store, and any liquor bought must be taken straight home (that is, for visitors, to the hotel bedroom) and not consumed outside. This applies to wines and beer as well (obtained from wine stores or brewers' retail stores). It is a serious offence to have opened bottles in a car. Cocktail bars exist in certain hotels and restaurants where alcoholic drinks may legally be consumed.

The Arts and Sport

Toronto is noted for its music. The Conservatory, started in 1886, has a proud history of achievement, and now has associated with it the well-known conductor Dr. Boyd Neel, once a medical practitioner in London. The Toronto Symphony Orchestra and the Mendelssohn Choir, with their conductor Sir Ernest MacMillan, are also well known outside Canada.

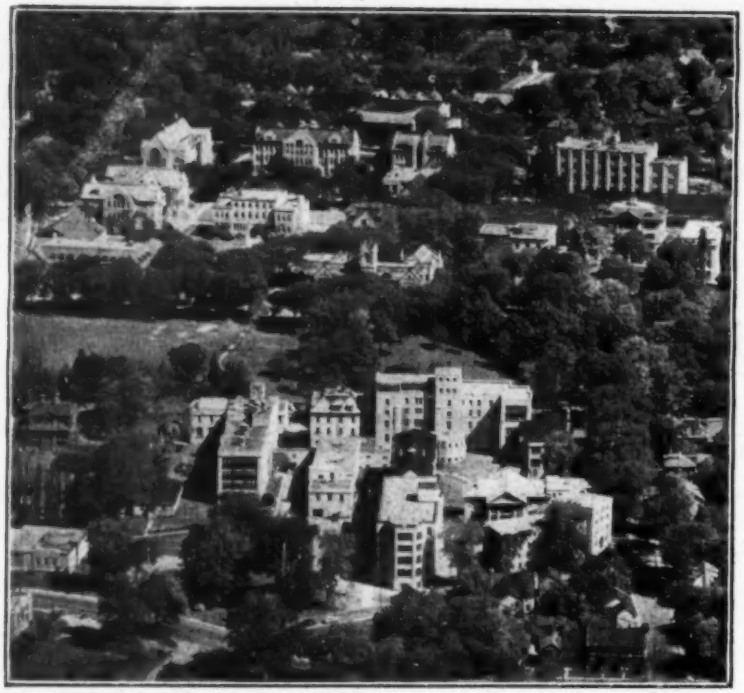
In Canada the theatre suffers from the enormous distances which touring companies must travel between cities, but there is a professional theatre, the Royal Alexandra, in Toronto, and a repertory unit, the Crest Theatre. To make up for the lack of professional shows there are thriving amateur groups in and around Toronto, including those who perform in the delightful little theatre in Hart House.

There is no need to comment on the cinema, save to mention that the democratic Canadian has one, and only one, price of admission.

Every summer sport practised in the United Kingdom has also its devotees in Toronto—even cricket, which has been edged out in the popular esteem by baseball, played at the Maple Leaf Stadium. Golf courses abound.

Warm Welcome

A warm welcome awaits the visitors from the United Kingdom in Toronto. Let them come with the resolve to enjoy Canada and to learn something of the country and its dynamic, friendly people. From my own experience, I can assure them that they will not be disappointed.



Queen's University, Kingston. Photo by the Photographic Survey Corporation Ltd., Toronto, Canada.

TOURS FROM TORONTO

[FROM A SPECIAL CORRESPONDENT]

It would be a pity to travel all the way to Canada without seeing more than Toronto. Restrictions unfortunately preclude free indulgence in the type of tour advertised in connexion with former B.M.A. meetings in Canada, such as the trip to Vancouver through the Rockies or the digression into the northern United States. It is not too much to hope, however, that a number of participants will find it possible to spend a few more days in Canada after the meeting and make some modest excursions into the beauty spots of Ontario. It is also hoped that the following brief outline of possibilities for such excursions may prove helpful to prospective tourists.

There are, of course, many other delightful holiday areas in Eastern Canada, both in Quebec and in the Maritime Provinces, and visitors may, for example, prefer to go direct to Montreal or Quebec and use either of these cities as a touring centre, in which case a fascinating introduction to French Canadian culture awaits them. It is nevertheless assumed that visitors with only a few days to spare will not wish to spend much time on travel, but will concentrate on areas within, at the most, 300 miles of Toronto. It should be emphasized that the Province of Ontario has an enthusiastic and efficient touring service, of a scope almost unknown in Britain, and is prepared to give very detailed advice on all tourist requirements. Prospective tourists should write to the Department of Travel and Publicity, Province of Ontario, Queen's Park, Toronto, Ontario, for information on such matters as accommodation.

Visitors from Britain may find themselves somewhat handicapped in touring Canada, since much holiday travel on the American continent is based on the assumption that the tourist has a car. Most tourists nowadays used roadside motels rather than the older type of hotel, and, whereas accommodation in the centre of a town is likely to be difficult and perhaps even primitive, clean and highly satisfactory motel cabins are seldom lacking along the more-travelled highways. If, therefore, the visitor can beg, borrow, or hire a car (there are several car-hire organizations in Toronto, and the rates are not too ruinous if several people share a car), his way will be made much easier. If not, he must rely on the train and the long-distance bus. All the areas mentioned below can be reached by public transport, and it should be remembered that the express motor coach in Canada really is an express (the Toronto–Barrie bus covers 55 miles in 1 hour 20 minutes).

Two more points should be noted in connexion with this article. Firstly, the reader should have a map of Ontario beside him. Incidentally, no one buys road maps in Canada: the filling stations give them away on request. Secondly, it is not proposed to devote much space to cities. The scenic glory of Canada is the work of nature, not of man. For those who must have a sight of bricks and mortar, however, there are suggestions below, such as visits to Ottawa, Kingston, and London (as a handy headquarters for one or more evenings at the Stratford Festival).

Ottawa and Kingston

Ottawa, the federal capital, is 280 miles by road from Toronto, and accessible by plane, rail, or bus. It stands on the Ontario bank of the Ottawa River, facing the province of Quebec, and owes its existence, like Canberra in Australia, to inter-city rivalry. Queen Victoria chose the then small town for the federal capital in 1857 to put

The mouth of the St. Lawrence, showing Old Fort Henry in the foreground and the city of Kingston in the background. Photo by Dick Herrington.

an end to the rival claims of Montreal, Kingston, and Toronto; hence all that is worth seeing in Ottawa is comparatively modern. The chief showplace is the group of Gothic buildings on Parliament Hill which house the Federal Parliament. Visitors are conducted through the building and up to the top of the Peace Tower, which commands a very fine view of the city and its beautiful setting, rich in parkland. There is a tourist bureau in the city, at which information on other sights can be obtained. The latter include the public archives, the Royal Mint, the National War Memorial, and the National Art Gallery, which has a good collection of Canadian paintings. The leading hotel is the Château Laurier, which sets a very high standard. Visitors are warned, however, that Ottawa is notorious for the scarcity of hotel accommodation, and booking well in advance is essential. A four- or five-day tour might be arranged from Toronto, with a first stop at Peterborough, as a centre for the Kawartha lakes (q.v.), and a second at Ottawa. The Peterborough–Ottawa road passes through some lovely and slightly wild country, and runs close to at least one little town worth an hour's visit. Perth, 58 miles from Ottawa, looks exactly like a small and neat Scottish town in pleasing grey stone set down in the midst of gentle countryside, which might also be Scottish. As might be expected, the town was settled by Scots, who have kept up the traditions of their native land. Although the Scot is ubiquitous in Ontario, there are certain enclaves where he is openly dominant, as in the little town of Fergus, in Western Ontario, where Highland Games are an annual event.

The return journey from Ottawa to Toronto might be made via Brockville, on the St. Lawrence. There are direct rail and motor-coach services between these towns, and Brockville, a pleasant and prosperous-looking town, is a centre for the Thousand Islands area (q.v.). The Peterborough–Ottawa highway and the Ottawa–Smith's Falls–Brockville highway both skirt the Rideau Lake district, a fine centre for fishing, swimming, or canoeing. The Rideau Lake district is traversed by the 126-mile Rideau Canal, completed in 1832 and linking Ottawa with Kingston. A six-day canoe trip along this canal is a possibility. The whole area is quiet and unspoiled.

Aerial view of Stratford, Ontario.

There is a charming road from Brockville to Kingston (about 50 miles); about 17 miles from Kingston the road forks, and the left-hand route runs through lovely scenery close to the point where the St. Lawrence leaves Lake Ontario. Kingston itself is an old university and military town dating from 1784, on to which a modern and unpleasing industrial area has been grafted. To appreciate the city it is necessary to turn aside from the completely characterless main street and look at the campus of Queen's University (1841), St. George's Cathedral (1825 on), and City Hall (1843). To the east, across the winding Cataraqui River, lies Old Fort Henry, built in 1832 and much visited by tourists.

The 165-mile road between Kingston and Toronto is pleasant enough, and is punctuated by a number of mellow small towns, of which Port Hope has perhaps the most character; but anyone finishing this trip by rail will have missed little.

London and Stratford

The opening of the current Shakespearean Festival at Stratford, now well known and well established, follows closely on the end of the B.M.A.–C.M.A. Annual Meeting. Tyrone Guthrie is sharing the direction this year with Michael Langham. The opening dates are: *Julius Caesar*, June 27 and 30; *Oedipus Rex*, June 28; *Merchant of Venice*, June 29 and July 1. A musical festival with Boyd Neel as conductor and internationally famous soloists begins on July 9. Festival information is obtainable from Stratford Shakespearean Festival, 109, Erie Street, Stratford, Ont.

Stratford is a small town 100 miles west of Toronto, of no particular cultural significance until, a few years ago, a local citizen had the inspiration to start an annual Shakespearean Festival, and the wit to see that nothing less than the best would prosper. Alec Guinness and James Mason are among those who have crossed the Atlantic to lend a hand in this commendable venture. While it is possible to visit the festival from Toronto, it would be much less fatiguing to make the city of London, 40 miles away, a headquarters. London, which lies on the little River Thames (as Stratford does on the Avon), was originally intended to be the capital of Upper Canada, but Toronto somehow displaced it. The city has on its north side the University of Western Ontario, including one of Ontario's

Ambassador Bridge, linking Windsor, Ontario, and Detroit and Canada's greatest border point of entry.

Some of the thousand islands of the St. Lawrence. Photo by Clint Melville.

four medical schools (the others are at Toronto, Ottawa, and Kingston), and offers the best accommodation and shopping facilities in the area. Pleasant bathing beaches on Lake Erie are to be found at Port Stanley, only 25 miles south of London.

The Muskoka Area

It is not until you fly over Canada that you realize how much of the country is under water, and why the birch-bark canoe is particularly associated in the mind with Canadian travel. It has been estimated, for example, that there are two million lakes in Ontario alone, so that it is hard to find a holiday resort that is not associated with a lake. To the north and north-west of Toronto there is a sort of horseshoe of lakes. Starting about 60 miles north of Toronto, the western end of the horseshoe begins at Lake Simcoe and its northern continuation, Lake Couchiching. Their close proximity to the city means that most of the shore has now been bought up for summer cottages, and the visitor will probably be better advised to continue north to Gravenhurst, just over 100 miles north of Toronto, easily reached by rail or bus, and the gateway to the next part of the horseshoe, the Muskoka Lakes. The top of the horseshoe lies north-east of Gravenhurst and is known as the Lake of Bays area; the horseshoe then sweeps down to the south-east through the Haliburton Highlands area (the best choice for those wanting to get off the beaten track) to the Kawartha Lakes area, more or less ending at the Toronto–Ottawa highway.

The Muskoka area is perhaps the most popular of these playgrounds for Torontonians, and the most developed. Lying at an altitude of about 1,000 ft. above sea level, there is a chain of three lakes with small resorts all round, and lovely scenery everywhere. It is possible to take a 100-mile steamer trip through the lakes, beginning and ending at Gravenhurst, and lasting all day. It is also possible to find most other forms of enjoyment somewhere in the area, such as swimming, boating, fishing, golf, tennis, and riding.

Lake of Bays

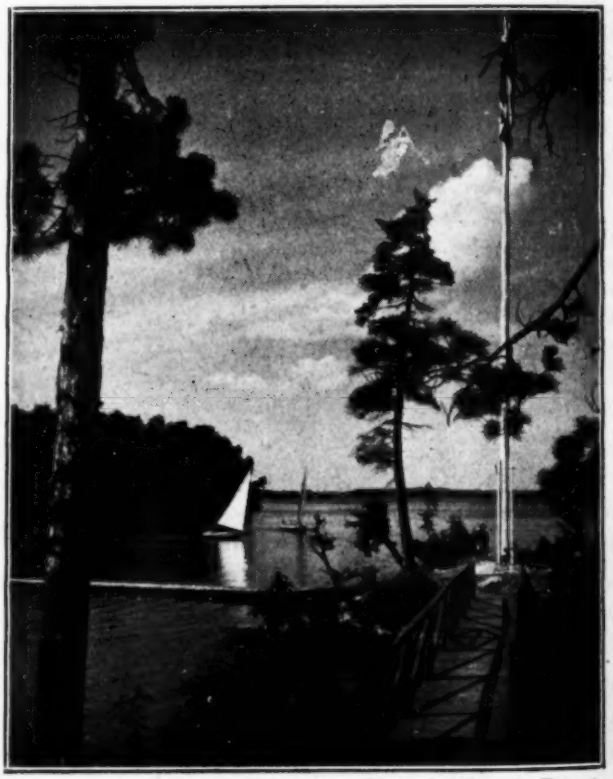
This area takes its name from the largest of the lakes it contains. To reach it the visitor must continue north by road or rail from Gravenhurst for 35 miles to Huntsville, the only town in the area, from which hotels of varying degrees of seclusion can be reached by taxi. The recreations are, as in the Muskoka area, fishing for bass and trout (perhaps with better success than in the more heavily fished south), boating and canoeing, and swimming.

Just south of the Lake of Bays there is one phenomenon much frequented by medical associations—indeed, some of the more rurally minded societies will be meeting there this June. This is the smart and luxurious Bigwin Inn, with 300 rooms and all indoor and outdoor amenities. Bigwin is on an island, and has to be reached by car and ferryboat from Bracebridge, a small town between Gravenhurst and Huntsville.

For those who do not want to wear formal clothes in the evening, there are many simple hotels in the area, offering peace without dance bands.

Algonquin Park

The visitor who has got as far as Huntsville now has two alternatives (indeed, three, if he wants to extend his trip still further north, into the wilder country near Lake Nipissing). He may swing round to the east and then south to the Highlands of Haliburton as a preliminary to returning to Toronto via the Kawartha Lakes, or he may go somewhat north and east to Algonquin Provincial Park. This is a Government game reserve, containing 2,700 sq. miles of wilderness in its natural state, and a wonderful area for the photographer. Fishing is permitted but not hunting, so that deer, bear, moose, and beaver go about their business without fear. A railway line and one highway run through the southern tip of the Park. There are hotels and cabin accommodation in this southern strip. If you want to explore the Park there are only two ways of doing so—by canoe or on foot. It is possible to hire a canoe and all the necessaries for camping at the Park Headquarters. It is also possible to hire a guide, and have a canoeing trip with portages from lake to lake planned for you. The most venturesome are not likely to come to harm without a guide, for maps are available and portages clearly marked, and in July the wilderness is by no means solitary.



Scene typical of the Muskoka area. Photo by Ontario Department of Lands and Forests.

Haliburton Highlands

The Highlands of Haliburton, which contain another 500 lakes or so, lie south of Algonquin Park and are worth a visit for three good reasons: there are even fewer people about than in the areas mentioned above; the scenery is, if anything, lovelier than anywhere else in Ontario; and the climate is invigorating. All this, it should be added, within 100 miles or so of Toronto. There are only two villages in the area—Haliburton and Minden—and everything is still very unsophisticated. The Highlands are recommended for the walker, the photographer, and the fisherman; swimming, sailing, and canoeing are also available. Lack of sophistication does not mean lack of accommodation, and there is a Highlands of Haliburton Tourist Association to help.

The Kawartha Lakes

South of the Highlands of Haliburton lies yet another lake area, the Kawartha Lakes, on an old Iroquois trail. This area is more developed than the Highlands and has two fair-sized towns—Peterborough (on the Toronto–Ottawa highway) and Lindsay—on its doorstep. In its centre lies the village of Bobcaygeon, with good accommodation and a very fishing-minded community. The lakes are connected by the Trent Canal, making canoe trips easier for the lazy. The scenery is well up to standard, and not as wild as further north. The main road south from Haliburton Highlands runs through this district to Lindsay, which is about 80 miles from Toronto by good roads. All these places mentioned are also accessible by rail.

The Thousand Islands

This area was mentioned in connexion with the return journey from Ottawa to Toronto via Brockville and Kingston. The thousand islands of the St. Lawrence are scattered through the river from Kingston to Brockville. Some are privately owned and have houses on them; some are mere tufts of grass sticking out of the river; some have fortunately been acquired by the Provincial Government as a national park and may be camped and picnicked upon. Their presence confers an exceptional beauty upon the river, and the occasional appearance of rapids adds to the attraction. The islands may be visited by one of the innumerable boats plying for hire either from Brockville or from Gananoque, a little holiday resort about halfway between Brockville and Kingston which lives for and on the river.

Conclusion

If any of the areas mentioned above seem particularly attractive to a prospective visitor, fuller information about it and a list of accommodation can be obtained from the Public Relations Officer, Ontario House, Charles II Street, London, S.W.1, or Department of Travel and Publicity, Province of Ontario, Queen's Park, Toronto, who are ready to advise on anything to do with holidays, from canoeing routes to non-allergenic areas. Fishermen in particular will be glad of the guidance this department can give.

INTERNATIONAL SOCIETY OF UROLOGY

TENTH CONGRESS

[FROM A SPECIAL CORRESPONDENT]

The tenth Congress of the International Society of Urology was held at Athens from April 10 to 18, under the presidency of Professor OECONOMOS. The subjects for discussion were the treatment of carcinoma of the prostate, renal angiography, and the post-operative management of urinary lithiasis.

Prostatic Cancer

The discussion on carcinoma of the prostate revealed a cleavage of opinion between those who advocated radical surgery and those who supported oestrogen therapy. It was agreed by all that the correct diagnosis in the early stages of the disease was difficult and that surgical intervention was likely to be successful only when the growth was mobile. There were some speakers who stated that they treated their cases in the first instance with hormones, and it was only when these failed they resorted to prostatectomy. Others pointed out that prostatic carcinoma was a chronic disease, and even without any treatment patients would live many years. There was no known cure for cancer of this organ, and both surgery and hormone therapy, though prolonging life, were palliative methods. FISH, of New York, claimed good results with massive doses of oestrogen, 500 mg. per day. MIGLIARDI, of Turin, considered that castration was a humiliating operation even in the elderly, and that synthetic hormone therapy had taken its place. Two British members, H. P. WINSBURY WHITE and J. D. FERGUSSON, made important communications. The latter described the results of adrenalectomy followed by cortisone therapy. This was one of the best scientific papers presented to the congress. There was no support for radiotherapy in cancer of the prostate, and treatment by isotopes was considered to be still in the experimental stage.

Renal Angiography

The reporters on renal angiography were J. C. DOS SANTOS (Lisbon); E. W. RICHES and I. H. GRIFFITHS (London); OLSSON, LINDBLOM, and SELDINGER (Sweden); and FABRE (Toulouse). All of them produced excellent papers. DOS SANTOS, the son of the first surgeon to introduce arteriography, claimed that complications could be avoided and were entirely due to errors of technique. RICHES and GRIFFITHS considered renal angiography a safe and simple procedure, but only an accessory method of diagnosis. It did not involve the use of costly apparatus. They preferred the lumbar route to the femoral, and advocated for the contrast medium 70% diodone, an organic iodine solution, whereas Dos Santos favoured 100% "shiodan." OLSSON preferred diodone. His paper should be read by all interested in this subject. LINDBLOM and SELDINGER pointed out that renal angiography had its limitations even in differentiating between renal cysts and tumours. FABRE stressed the importance of team-work. In the subsequent discussion the consensus of opinion was that the procedure is comparatively safe, and there was general agreement with the views expressed by Lindblom and Seldinger. N. OECONOMOS, in a thoughtful paper, stated there were only two indications for renal angiography: as an aid to the diagnosis of tumour, and to determine renal function.

Urinary Calculus and Other Subjects

The discussion on the post-operative treatment of urinary lithiasis was disappointing. There was a repetition of all the well-known methods which have been tried to prevent the recurrence of stones. Nothing new emerged from the various papers presented by urologists from all parts of the world. LEWICKI, of Poland, stated that he could control proteus infection of the urinary tract by sulphafurazole ("gantrisin"). TAYLOR, of New York, claimed that with "solution G" most phosphatic stones could be dissolved. On the other hand L. N. PYRAH, of Leeds, got good results with aluminium hydroxide. His paper was an interesting one. The other British urologist to take part in the discussion was H. P. WINSBURY WHITE. FEY, of Paris, in his communication pointed out that the calculus was not the primary condition, and that, apart from sepsis, mechanical obstruction, and parathyroid disease, we did not know the origin of the illness.

On the fourth day various short papers were read and a number of films shown. This in some respects was the most instructive session of all, the films in particular being excellent. T. I. CHAPMAN (Glasgow) showed his film, already known to British audiences, of the punch operation for prostatic obstruction. His running commentary was excellent, and that and the film were well received. SERRALLACK'S

(Barcelona) film of perineal prostatectomy caused much amusement, as the speed of its presentation was such that the whole operation appeared to be completed in five minutes, but every detail of it could be easily followed.

FEY (Paris) and H. G. HANLEY and J. J. STEVENSON (London) demonstrated the use of the image intensifier in urology. Hanley and Stevenson's film was outstanding and was one of the highlights of the congress. It gave a remarkable picture of the movements of both the normal and the diseased ureter.

For the first time since the war representatives of Russia, Czechoslovakia, Poland, and West Germany were present at the congress. Your correspondent was informed by the President of the Polish Society of Urology that in his country specialists are allowed to accept fees for private consultations, but all operations are free and have to be performed in the State hospitals. No drugs other than streptomycin are available from Russia.

Following the resignation of Dr. GEORGE GILBERT SMITH (Boston, U.S.A.), Mr. A. CLIFFORD MORSON (London) was elected President of the International Society of Urology.

During the congress there were the usual social engagements for the members and their ladies. About 300 were present at the banquet. Professor OECONOMOS presided, and in his speech paid tribute to British urology. Mr. CLIFFORD MORSON proposed his health. After the congress there were visits to islands in the Aegean, and a few hours were spent at Crete, Rhodes, Cos, Delos, and Mykonos. The meeting was well organized by our Greek colleagues, to whom the thanks of all members are due for their hospitality and unfailing courtesy.

Future Arrangements

At the meeting of the general assembly it was agreed that the congress in 1958 should be held in Stockholm under the presidency of Professor Hellström and that the following subjects should be discussed: the bladder in neurology; the use of intestinal grafts in urology; and essential haematuria.

HYPNOTISM IN DERMATOLOGY

DERMATOLOGISTS GROUP DISCUSSION

A meeting of the Dermatologists Group of the Association was held at B.M.A. House on April 21, when a brief discussion took place on the impact of psychiatry on dermatology, with special reference to hypnotism. Dr. D. I. WILLIAMS was voted to the chair.

The discussion was opened by Dr. E. A. BENNET, speaking as a psychiatrist and a member of the subcommittee which produced the recent B.M.A. report on hypnotism (see *Supplement*, April 23, p. 190). The subcommittee, he said, was appointed following considerable publicity, in the press and elsewhere, concerning hypnotism. Medical men were being asked questions by their patients about the efficacy of hypnotism, and they sought guidance from the Association as to the correct attitude towards hypnotic treatment and its applications. The subject was regarded as mysterious by some; others looked askance at it—not without reason, as hypnotism had hovered for years on the borderline of medical respectability.

The B.M.A. Report

The subcommittee had examined the past and, in particular, the recent history of hypnotism, and discussed its use with physicians who had observed hypnotic treatment and with psychiatrists who had personal experience of its clinical applications. They reached the conclusion that no one—not even enthusiastic hypnotists—knew exactly what hypnotism was. Nevertheless, it was clear that a great deal was known of its value and limitations in medical practice and in dentistry. It seemed clear, moreover, that the doctor–patient relation in hypnotic therapy was of special importance—as it was in other forms of psychological treatment. Further, suggestion was known to play a part, and often a decisive one, in certain types of medical treatment, perhaps despite the doctor's intention. Certainly a common element in different and even in apparently opposite methods of psychological treatment was the relation formed between doctor and patient.

Dermatology was no exception to this common experience, said Dr. Bennet, and suggestion, wittingly or unwittingly, was an element in treatment. Hypnosis was an extension of suggestion, and in no essential way did it differ from it. It had been used with success in the treatment of skin complaints. The direct (as opposed to the indirect) use of suggestion was often ineffective because the therapist gave the suggestion in an expectant but haphazard fashion. Suggestions, he continued, should always be spontaneous, and set phrases were best avoided. The therapist must be sincere: it was worse than useless to give suggestion whose value was doubted. And concrete suggestion was far more valuable than abstract suggestion, as it enabled the patient to form a mental picture, for example, of the disturbed or diseased part of his body.

An opinion widely held but without foundation was that the hypnotist possessed a special "gift"—the hypnotic eye or some esoteric endowment withheld from lesser mortals. There was no mystery about the induction of hypnosis and no special skill was required. Indeed, one of the dangers of hypnotism lay in the fact that it was so simple. Consequently it was seized on by charlatans who had no sense of responsibility for the patient and no regard for the medical code of ethics. The report on hypnotism advised that hypnosis should be in the hands of medical men trained to recognize the characteristics of over-dependence. Research on this topic was required. The subcommittee had no clear evidence upon the extent of the danger or the quality of the danger to a patient which some psychiatrists claimed inevitably followed the induction of hypnosis.

Psychiatry in the Skin Department

Dr. HUGH GORDON, physician in charge of the skin department at St. George's Hospital, described a psychiatric attack on skin patients, mostly chronic, conducted from June, 1951, for roughly 2½ years. The work resulted from Dr. Kathryn Cohen's experience in her appointment as junior registrar. By taking more time and showing more interest in the chronic patients she came to the conclusion that many of the cases were primarily skin reactions to emotional stress. It was determined to collect 100 or so cases, keep careful records, and follow them up. Altogether records had been obtained of 144 patients. Hypnosis was started in the form of simple suggestion. Varying degrees of hypnotic trance were obtained, and during the hypnotic state the suggestion was given that the skin condition would resolve and return to normal and that irritation, if present, would go. In most of the conditions treated pruritus was a marked feature, and it was certainly found that the anti-pruritic effect of simple hypnosis was often very striking.

It soon became apparent that under hypnosis the doctor–patient rapport was considerably enhanced. Patients became much more willing, so to speak, to "let their hair down." Consequently psychotherapy was added to hypnosis. The largest group of cases was atopic eczema, and at the outset they had one of those possibly therapeutic freaks in which the direct effect of hypnosis was surprisingly good. A boy of 12, a constant sufferer from eczema and asthma from the age of 2, was completely cured of both in about six sessions, and had remained clear for 2½ years. Later a number of cases were encountered which had proved extremely resistant.

During the last 18 months, continued Dr. Gordon, Dr. Cohen had felt that in many cases the underlying psychosis required lengthy treatment, and such patients had been referred to the Cassel Hospital.

It was too early as yet to assess the results. Two cases, however, had taught them an important lesson. An exacerbation of the skin condition was expected during therapy,

but it occurred so drastically that these two patients had to be readmitted to the general wards. The raised temperature and grave superficial sepsis did, in fact, clear up very quickly. But this incident illustrated the necessity of one department being able to tackle the patient throughout.

There were four cases of dermatitis herpetiformis among those treated. Two were described as failures, but in fact broke off treatment for other reasons. In the other two very striking successes were obtained, said Dr. Gordon. One of them with a 10-years history was controlled by arsenic, but developed severe and obscure retinal lesions. On stopping the arsenic the latter improved, but the dermatitis herpetiformis relapsed. Both skin and eye lesions cleared up rapidly under hypnosis and psychotherapy, and had remained so for two years.

What part did hypnosis *per se* play in achieving these results in dermatological cases, such as they were? Had the results obtained been due to a combined dermatological–psychiatric approach with perhaps a slightly new slant? He himself saw the patients before, during, and after treatment. He did practically none of the treatment himself, and he had tried so far as possible to play the part of an unprejudiced observer. He believed it was possible—indeed probable—that the psychiatric factor was of aetiological importance in varying degrees from 100% down to 50% in a wide range of common skin disorders. In the so-called frictional type he thought it might well be 100%. But even if it was felt that the psychological factor was likely to be a high percentage, most dermatologists would agree that they were justified in trying purely symptomatic treatment, such as local applications, sedation, *x* rays, or hydrocortisone, which last had certainly proved to be sometimes extremely effective in cases of localized neurodermatitis.

If it was felt that cases must be treated from the psychiatric angle, then there were two alternatives for the dermatologist: either to refer the patient to the psychiatrist or to attempt the treatment himself. They would all choose to refer the patient, but this might mean an undue influx in the psychiatric department. Dr. Gordon concluded that hypnosis appeared to be of value in treating these skin patients, and he felt that dermatologists should undertake a greater part of the psychiatric treatment themselves.

In the course of a very brief general discussion—brief because of the imminence of another meeting—Dr. KATHRYN COHEN gave some details of her experience at St. George's, bearing out Dr. Hugh Gordon's statements.

In reply to Dr. C. H. WHITTLE, Dr. BENNET said that transference inevitably occurred, but that something similar to it occurred in every relationship of a confidential nature, medical or lay.

Dr. WHITTLE said that a great deal of the difficulty of getting patients into the mood to be approached by a psychiatrist might be overcome by having the psychiatrist in the room at the same time as the patient was being seen by the dermatologist. This double approach had worked well, but was time-consuming.

Reports of Societies

DISEASES FROM PETS

On April 20 the Section of Comparative Medicine of the Royal Society of Medicine met to discuss "Some Diseases of Pets Transmissible to Man."

Psittacosis

Professor S. P. BEDSON, F.R.S., opened the meeting with an account of psittacosis. Although, he said, it had been recognized for eighty years that parrots suffered from a disease to which man was susceptible, it was not until the investigations of the pandemic of 1930 that the connexion was firmly established by the isolation of the same virus from human and psittacine cases. It was now known that there was a group of psittacosis viruses with similar morphological and staining characteristics and sharing an antigen. A wide variety of avian species were naturally susceptible, and both domestic and wild birds had been found to harbour the virus. Atypical pneumonia in the Faroe Islands had been shown to be due to psittacosis virus, the infection coming from fulmar petrels, and many human infections originating in pigeons, turkeys, ducks, domestic fowls, pheasants, and other birds were on record. Mammals, such as the cat, sheep, cattle, and laboratory mice, had also been shown to be the natural hosts of related viruses, but these mammalian viruses appeared to be less closely related to the avian strains than the latter were to one another. There was no good evidence that these mammalian viruses produced infections in man, though outbreaks of a febrile exanthema among natives in the Belgian Congo seemed to be connected with an infectious disease in cattle, sheep, and goats often resulting in abortion, and a psittacosis-like virus seemed to be responsible for both.

All the avian strains seemed capable of producing disease in man, went on Professor Bedson. As a source of human infection psittacine birds were of more importance than the non-psittacine. There were several reasons for this. For one thing parrots and their like lived in closer association with man than do the other avian hosts of the virus. Psittacine birds responsible for human cases were usually recently imported birds suffering from acute disease as a result of the conditions under which they were transported, and acutely ill birds excreted vastly more virus than healthy carriers. Lastly the strains of virus from psittacine birds seemed more virulent for man than the so-called ornithosis strains. Laboratory infections had been numerous and passage from man to man occurred occasionally; a number of cases gave no history of even remote contact with an infected bird. Under natural conditions infection in the bird was nearly always silent, though occasional outbreaks of disease did occur. The young birds were infected by their parents whilst in the nest, and the virus was excreted in the droppings. Spread of infection to man was through the air in the form of dried droppings, though direct contact with infected birds was occasionally responsible.

Attempts had been made in this and other countries to protect man against psittacosis by imposing controls on the importation of parrots, but realization that non-psittacine birds harboured the virus resulted in the ban being lifted in some countries. As a consequence there was a sharp increase within a few months in the number of human cases of psittacosis in England, and the disease appeared for the first time in New Zealand, a country which had previously been free. The ban was soon reimposed.

Salmonellosis

Dr. A. BUXTON discussed the incidence of salmonellosis among pets. The organisms were widely distributed among animals, and surveys had shown an infection rate of about 1.5% among domestic dogs and cats. As many as 18% of the animals in kennels might be found to be infected, probably owing to the presence of salmonella organisms in their food. For example, 26 out of 98 samples of a proprietary preparation of dog food containing meat had proved to be infected. Children were particularly liable to infection because they tended to handle and fondle pets more than adults.

In America many salmonella types had been recovered from animals, but in England only a few had been identified, of which *S. typhi-murium* was the most important. Dogs might carry several different types without showing symptoms, while in contrast over 40% of clinical infections were due to *S. typhi-murium*. Pigeons were salmonella carriers, and occasional human cases had been traced to this source. Tortoises were also known to be infected, but the danger of human infection was probably slight. There was little evidence available about other pets, but all were probably susceptible.

The danger of human infection must not be over-emphasized, said Dr. Buxton in conclusion, but it was necessary

to stress the importance of hygiene when dealing with pets, especially during epidemics, and the need for eradicating salmonella from their food.

Parasitic and Fungal Diseases

The last contribution was by Mr. G. C. BRANDER, who spoke on parasitic and fungal infections. The development of insecticides and fungicides had done much to reduce the incidence of infection, he said, but there was still need for liaison between the doctor and the veterinary surgeon. It was often easy to overlook the animal while treating the infected child. Immunity to parasites undoubtedly increased with age, but host resistance could be lowered by other infections and there were considerable individual variations in response. Parasitic infections were liable to become eczematized if not treated early, and, in the case of mange, irritation might remain for a considerable time after the mite had been eradicated. Individual lesions due to fungi were often difficult to spot in animals, and tended to be situated deep in the hair follicle. Thorough treatment of the whole animal was important, but it should be borne in mind that cats were particularly sensitive to many types of drug.

In the discussion which followed it was stressed that, with the possible exception of fungal and leptospiral infections, human infection from pets was relatively infrequent, even when attendants were in contact with outbreaks of disease among such animals as monkeys and poultry.

RESISTANCE TO INFECTION

Metabolic and Other Factors

Dr. RENÉ DUBOS, of the Rockefeller Institute, New York, was the guest speaker at a meeting of the Section of Pathology at the Royal Society of Medicine on April 25. After welcoming him, Professor L. P. GARROD, president of the Section, invited Dr. Dubos to open the meeting with a paper entitled "The Effects of Metabolic Factors on the Infectious Process."

Starvation and Susceptibility

Dr. DUBOS began by describing variations in the rate of growth of *Mycobacterium tuberculosis* in mice whose metabolism had been artificially disturbed. Dr. Dubos said that he had produced metabolic changes in the following ways: by giving thyroxine and dinitrophenol in doses sufficient to prevent weight gain; by adding sodium citrate and hexabutyrate to the standard diet; and, lastly, by depriving the mice of food for 36 hours at a time. All these measures had increased the susceptibility of the mice to tuberculosis as well as to other bacterial infections.

The effect produced by fasting was not merely due to diminution of caloric intake. It was rapidly reversible: within 48 hours of giving the full diet, resistance returned to the normal level. Neither was it due to loss of weight, since diets partly deficient in protein which prevented weight gain did not affect resistance. All the experiments using *M. tuberculosis* were measured by means of survival times.

Mice starved for 36 hours before injection were more susceptible to a heat-killed suspension of Gram-negative bacilli or a toxin derived from *M. tuberculosis* than were normal mice. By starving for 48 hours and subsequently feeding on a protein-free diet the susceptibility was increased tenfold. From this Dr. Dubos concluded that altered tissue metabolism enhanced susceptibility.

In one experiment, using *Klebsiella pneumoniae* Group C, there were two groups of mice. One, the control group, was fed on the standard Sherman diet. The other group was fed for seven days on a protein-free diet and was completely starved for 24 hours before the intravenous injection of the organism. Recovery rates of the organism ten hours after injection were several thousand times greater in the test than in the control group. This type of experiment was repeated in many circumstances in an attempt to find a direct cause in the diet.

In most of these experiments, staphylococci were the organisms used. If, 48 hours after injection, food was withdrawn for a period of 36 hours rapid multiplication of the organisms took place. Substitution of carbohydrates for the normal diet also hastened death of the animal. Where normal mice showed a steady decline in the number of recoverable organisms, mice whose weight gain was retarded by thyroxine showed a rapid rise in the number of organisms and subsequent death. Dr. Dubos interpreted this as an interference with the metabolism of the cells of the reticulo-endothelial system.

The standard Sherman diet restored resistance in 48 hours. However, diets containing vitamins, minerals, amino-acids, carbohydrates, and fats, but deficient in a "complete" protein were found to be inadequate. Not every protein was found to restore resistance, but casein did so in every case.

Possible Mechanisms

Dr. Dubos had confirmed previous work showing that mice were rendered more susceptible to infection by the use of "Krebs cycle poisons." Susceptibility to infection was increased by procedures resulting in at least three metabolic disorders—depletion of intracellular glycogen, reduction in the glycolytic activity of inflammatory cells, or an increase in the tissue levels of certain polycarboxylic acids and ketones. Interference with ordinary antibody responses could not account for the increased susceptibility of the mice, as the huge differences in tissue bacterial population were evident long before any immune response could have occurred. Furthermore, starvation did not lessen the immunity of vaccinated mice.

In conclusion, Dr. Dubos expressed his belief that some of his findings might have a wider epidemiological bearing. His experiments illustrated, for example, that susceptibility to infection could change rapidly and reversibly, independently of the immunological state, merely in response to physiological stresses of the kind encountered in everyday life. The findings in mice also suggested that the sugar-vitamin–amino-acid mixtures so commonly given to patients in emergency situations might not be the best for restoring resistance. Nor were the food factors essential for growth, reproduction, and other normal physiological processes necessarily the most important in promoting resistance to infection.

The Immediate Vascular Reaction

Professor A. A. MILES, director of the Lister Institute, London, said he proposed to discuss an earlier stage of infection, more physiological than biochemical. In an attempt to assess the value of the defence reaction, using guinea-pig skin, he injected a known dose of organism and assessed the effect of local modifiers by the subsequent size of the lesion. The most useful modifier was found to be adrenaline in a dose whose sole effect was two to three hours' local ischaemia.

Arguing from the degree of enhancement of infection produced by the adrenaline, the early vascular reactions inhibited by the adrenaline were responsible for a 99% to 99.9999% kill of the injected bacteria, according to the species of pathogen used. Moreover, this defence reaction, which determined the maximum size of the lesions in the skin, could be shown with many organisms to be complete within a decisive period of four hours. In infections with slower-growing mycobacteria, as might be expected, this decisive period was much longer.

Professor Miles also produced evidence suggesting that in allergic animals, though delayed allergy promoted infection with tubercle bacilli, the early exudation resulting from the anaphylactic element of tuberculin allergy might have survival value for the animal.

Importance of Insulin

Dr. D. A. LONG, of the National Institute for Medical Research, Mill Hill, said that bacterial infection was a cause

of "stress" which induced a profound change in hormone balance in the rat and adrenocortical stimulation in man. The guinea-pig, went on Dr. Long, responded to "stress" like man, was readily sensitized to tuberculin, and produced antitoxin that quantitatively and qualitatively resembled that produced by man. Also, loss of body weight, and suppression of gamma globulin and antitoxin synthesis, were not induced by large doses of cortisone in man or guinea-pig, although observed in the rat, rabbit, mouse, and ferret.

Dr. Long said that he had shown thyroxine-treated guinea-pigs to be more sensitive to intradermally injected tuberculin and to produce more diphtheria antitoxin than control animals. Cortisone depressed sensitivity to tuberculin in both thyroxine-treated and control guinea-pigs, but was without significant effect on antitoxin synthesis. Insulin increased sensitivity to tuberculin, but, owing to the compensatory phenomenon induced, a direct study of the effect of insulin on antitoxin production could not easily be made. However, partial pancreatectomy abolished both hypersensitivity and hyperimmunity resulting from treatment with thyroxine.

From a study of the interrelationships of these effects, Dr. Long concluded that insulin output was the most important single hormonal factor that influenced immune and allergic responses of the guinea-pig to bacterial infection.

Role of the Gut Flora

Dr. G. G. MEYNELL (Postgraduate Medical School) discussed two factors influencing the dose of a highly streptomycin-resistant strain of *Salm. typhi-murium* required to infect mice by the oral route. The acidity of the gastric contents did not always play an important part under experimental conditions. By giving 50–1.6 mg. streptomycin to mice 24 hours before challenge by this strain of *Salm. typhi-murium* he found a great increase in the subsequent numbers of the organism in all parts of the gut. He also found that 50 mg. streptomycin greatly increased the susceptibility of mice to infection, the LD50 being reduced from $>10^6$ to two organisms, so confirming the work of Bohndorff and her colleagues. Both findings were presumably due to the action of streptomycin on the normal gut flora. Dr. Meynell also described a spontaneous epidemic due to an oxytetracycline-resistant strain of *Proteus* which occurred in a mouse stock under treatment with oxytetracycline and which was ended by withdrawing the antibiotic.

In the discussion Dr. DUBOS criticized Dr. Meynell's use of hydrochloric and citric acid as a suspending medium, suggesting that citric acid had a protective action on the organism. He quoted experiments showing that *p*H, *per se*, was of only relative importance and it was the anion which exerted a specific effect. He suggested that the resistance was due to the metabolic state at the site of infection. Accumulation of carboxylic, keto- or lactic acids could completely change the environment. Immunity processes could not be independent of the metabolic state. They acted by accelerating and focusing the inflammatory state at the site of infection.

Professor GARROD pointed out that gastric acidity was of importance in the destruction of organisms given by the oral route. Professor CRUICKSHANK agreed, and suggested that in view of this the assessment of infection was more easily controlled by using the conjunctiva as the site of infection.

Dr. DUBOS regarded the actual dose as of less importance than the nutritional state of the mouse, which he claimed varied greatly in a short time. Some discussion followed about the suitability of the mouse as an experimental animal. When asked if he considered that one common factor was operating at the site of infection, Dr. Dubos said that indeed many apparently unrelated stresses might operate through only one or a very few essential mechanisms. For example, many various types of metabolic or toxic disturbances could cause a depletion of glycogen followed by failure of phagocytosis and loss of lactic acid production leading to a decrease in resistance.

Correspondence

Tuberculosis After B.C.G. Vaccination

SIR,—In your leading article on tuberculosis after B.C.G. vaccination (*Journal*, April 30, p. 1076) you quote Ustvedt[1] as saying that a primary focus can result from the superinfection of a person successfully vaccinated with B.C.G. This statement is so self-contradictory that I consulted the report to see if you had misquoted it, but I found that your quotation was accurate. I then consulted the full report of the Conference on European B.C.G. Programmes[2] (on which the *Bulletin of the World Health Organization* concerned appears to have been based), and on page 271 the following statement by Ustvedt appears: "There is no reason to doubt that a lung focus develops on superinfection (cf. the investigations in guinea-pigs by K. A. Jensen), but this focus does not usually seem to reach such an extent that it becomes visible on the chest film. The disappearance of the manifestations of primary tuberculosis seem [*sic*] to a high degree to characterize most of the groups of B.C.G. vaccinated individuals studied." I have no doubt that this statement is the correct expression of Ustvedt's views. The other statement may have suffered by mistranslation.

As regards the occurrence of tuberculous meningitis and miliary disease in vaccinated persons, Ustvedt[1 2] states that, from the work of the Joint Enterprise in various European countries (6 million vaccinations), the Danish campaign in Germany, and the Norwegian campaign in Italy, 21 cases of tuberculous meningitis and miliary disease had been reported. Many of these occurred within two months of vaccination, and by your own terms these are excluded ("disease that follows a natural infection occurring just before vaccination or a few weeks afterwards during the pre-allergic phase"). This may not be convincing statistical evidence, but it is impressive.

The occurrence of fatal tuberculosis due to the vaccine itself is, as you say, of great interest, and the findings presented in some of the original reports are difficult to interpret. In the case reported by Meyer and Jensen[3] the post-mortem findings showed "a peculiar picture of atypical tuberculosis." The pathologist who made the post-mortem examination reported that he could not categorize the findings and had no explanation to offer for the atypical pathological condition. In Thrap-Meyer's[4] case the patient was known to have had a raised erythrocyte sedimentation rate (40 mm.) for many years before vaccination, and although there was an interval of 4½ years between vaccination and death from generalized tuberculosis histological examination of lungs, spleen, urinary bladder, rectum, and bone failed to reveal any tubercles. The failure of the patient's tissues to react to the infection with B.C.G. was not explained. Your conclusion that the danger of B.C.G.-produced tuberculosis is too remote to be alarming is justified by the facts.—I am, etc.,

Whitehead, Belfast. H. G. CALWELL.

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2 —— *Conference on European B.C.G. Programmes*. International Tuberculosis Campaign, 1950, 271.
3 Meyer, J., and Jensen, J. A., *Amer. Rev. Tuberc.*, 1954, **70**, 402.
4 Thrap-Meyer, H., *et al.*, *Acta tuberc. scand.*, 1954, **29**, 173, 180, 188.

Non-virilizing Androgens

SIR,—Substances like methylandrostenediol and methylandrostan 17ol -3one are being presented by the makers to medical men as "non-virilizing androgens" and "free from the side-effect of virilization in the recommended dosage." These statements are true relative to testosterone and methyl testosterone, with which these substances are compared. The statements may even be absolutely true for the majority of patients. However, in my clinical experience, although these substances may not produce true virilism, they may produce some growth of facial hair and even some deepening of the voice when given over prolonged periods in the

"recommended dosage." Since they are easily taken by mouth, and since they are advocated in a large number of conditions for "adults (both sexes) and children (boys and girls)," I think it prudent for practitioners to be aware that these substances are mildly androgenic, especially if they are prescribed for patients who are not seen for long intervals. The androgenic effects may be disconcerting, but tend to disappear on ceasing the "therapy."

In animals, immature rats,[1] taking the weight of the seminal vesicles as a criterion, "the compound (methylandrostenediol) was found to have about one-third the androgenic action of testosterone, subcutaneously, and about the same activity as methyl testosterone, orally." Although other tests—e.g., capons—indicate only one-fiftieth the activity of testosterone, and although the anti-oestrogenic and nitrogen anabolic activity are undoubtedly greater than the androgenic action, comparing methyl androstenediol with methyl testosterone, the experimental evidence does not permit one to ignore that methylandrostenediol and methylandrostalone are potentially androgenic, even if feebly so. This letter is not, of course, an attempt to assess usefulness in appropriate cases.—I am, etc.,

London, W.1. S. LEONARD SIMPSON.

REFERENCE

[1] Henderson, E., and Weinberg, M., *J. clin. Endocrinol.*, 1951, **11**, 641.

Measurement of Cholinesterase Activity of Whole Blood

SIR,—The periodic measurement of blood cholinesterase activity provides a valuable guide in the protection of spraying operators and other users against the risk of cumulative over-exposure to anticholinesterase organic phosphorus insecticides.[1] Unfortunately, the methods until recently available, as reviewed by Aldridge,[2] prove somewhat demanding as regards laboratory time, trouble, equipment, or experience, and in this country few laboratories are able to provide the prompt routine testing service really needed. However, in 1953 Limperos and Ranta[3] described a simple and speedy colorimetric method which has already been successfully used in North America.[4]

The principle of Limperos' method is that the cholinesterase activity of the whole blood sample determines the rate of colour change in a system comprising the enzyme (blood sample), substrate (acetylcholine), and indicator solution (soluble bromthymol blue, green-blue at *p*H 7.2, continuously changing to orange-brown at *p*H 6.2). Blood samples of unknown cholinesterase activity can thus be compared with normal control samples from healthy unexposed persons, either by measuring the time needed for the full colour change to be completed under standard conditions, or by measuring the amount of colour change occurring in the unknown samples when a normal sample has just completed the colour change, or after some arbitrary incubation time. The latter approach seemed to offer certain advantages in practice, and has led to the development of a series of permanent coloured glass standards calibrated at intervals of 12.5% normal cholinesterase activity, permitting the use of a visual comparator to ensure consistent readings in successive tests.

The method described, therefore, consists of pipetting 0.01 ml. whole blood from a normal unexposed person, and then from each worker to be tested, into clean reaction tubes each containing 0.5 ml. of an 0.044% aqueous solution of the bromthymol blue. The substrate, 0.5 ml. of an 0.5% solution of acetylcholine perchlorate, is then added to each reaction tube at a convenient time interval—for example, 1 minute. All tubes are allowed to stand at room temperature, the progressive colour changes occurring in the "control" tube being followed by periodically decanting the solution into the comparator cell, and matching with the series of calibrated disks. When the control tube contents just attain "100% activity," usually within 25 to 30 minutes at temperatures in the 15 to 20° C. range, the unknown samples are successively matched against the disks, again at 1 minute intervals, and the per cent whole blood cholinesterase activity read off. Precautions must be taken against acid or alkaline contamination (even by respiratory CO_2), against residual insecticide on the worker's skin, and against deterioration of the substrate solution. With those precautions, we have found the method very satisfactory in its speed and simplicity, the results obtained agreeing very well (within one disk, or 12.5%) with the correct activity of normal and low-activity samples, as measured by the Michel electrometric method.[5]

The main advantages of the colorimetric method using comparator and calibrated disks are that it can be carried out on very small samples of blood, with simple equipment, reasonable accuracy, and good reproducibility, away from the laboratory if and when necessary. The degree of error of the method is considered acceptable for both routine and emergency estimations. The 95% range of normal whole blood activity extends from 80% to 120% of the mean value, while major anticholinesterase intoxication is most unlikely at blood activities above 25% normal. Between 25% and 75% normality, symptomless over-exposure to an anticholinesterase may recur.

The visual comparator, calibrated "cholinesterase disk," and full technical details of the method are now available from Messrs. Tintometer Limited, Waterloo Road, Salisbury, for whose collaboration we are most indebted. The early work on this modification was carried out by Mr. K. P. Fellowes.—We are, etc.,

E. F. EDSON,
M. L. FENWICK,
Medical Department,
Fisons Pest Control Limited.

Cambridge.

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[1] Edson, E. F., *British Medical Journal*, 1955, **1**, 841.
[2] Aldridge, W. N., and Davies, D. R., ibid., 1952, **1**, 945.
[3] Limperos, G., and Ranta, K. E., *Science*, 1953, **117**, 453.
[4] Wolfsie, J. H., and Winter, G. D., *Arch. industr. Hyg.*, 1954, **9**, 396.
[5] Michel, H. O., *J. Lab. clin. Med.*, 1949, **34**, 1564.

Intramuscular Chloroquine

SIR,—There has been much criticism on the intramuscular use of quinine for the reason that such method had on occasions developed localized necrosis of the muscular fibres with subsequent abscess formation, thus creating a favourable cultural medium for tetanus and other organisms. In addition to the abscess formation, gas gangrene and streptococcal septicaemia may ensue. Intramuscular quinine injections have also been known to produce very painful fibrous nodules which after many years may break down and give rise to suppurating sinuses.

To obviate such potential complications, I have started to use intramuscular chloroquine injections for my malarial cases. The site chosen was the anterolateral aspect of the middle part of the thighs. Since May, 1953, intramuscular injections of chloroquine have been given to 617 cases of malaria, mostly of cerebral type, with temperatures ranging from 101° F. to 105° F. (38.3° C. to 40.6° C.). The cases included mostly infants and children under conditions where the oral route was found impracticable. The figure 617 included 415 cases under 1 year, 130 cases under 6 months, 80 cases under 3 months, and 27 cases under 1 month. The youngest infant to receive the injection was 3 days old.

Not a single case showed any local abscess formation or other complications. It is hoped that the observations made will be of much guidance to those who have abandoned the intramuscular use of quinine among their patients, especially the infants and children, for fear of abscess formation.—I am, etc.,

Perlis, Malaya. ABDUL WAHAB ARIFF.

Chlorpromazine in E.C.T.

SIR,—In a small series of in-patients receiving modified electroplexy we have been impressed by the value of chlorpromazine as a pre-operative sedative. The average dosage of the drug which we employ is 50 mg., given by mouth two hours before treatment; this is followed by a hypodermic injection of scopolamine 1/150 gr. (0.43 mg.), or atropine 1/75 gr. (0.86 mg.) one hour before treatment. Anaesthesia is induced with a sleep-dose of thiopentone followed by succinylcholine 50–75 mg.

We have found that this use of chlorpromazine gives the following results: (1) A markedly tranquillizing effect (most welcome in the agitated depressive types, so often resistant to repeated treatment); (2) venous dilatation accompanying an increase in the warmth of the extremities. This latter

feature has greatly facilitated venepuncture in patients in whom the extremities were habitually cold, the veins contracted and impalpable, even in warm surroundings.

Since the exhibition of chlorpromazine considerably reduces the amount of thiopentone required to abolish consciousness, recovery time is not significantly retarded; this would suggest that, in suitably selected cases, the drug could be used safely in this way for ambulant patients.—We are, etc.,

J. D. W. PEARCE.
H. L. THORNTON.

London, W.2.

Measles

SIR,—In your leading article (*Journal*, April 23, p. 1018) I was interested that the occasional difficulty in distinguishing between measles and the early stages of scarlet fever should have been mentioned at a time when I was about to report the following rather unusual case.

A boy, aged 2½ years, had scarlet fever in January, 1955. On April 1 he had a running nose, a hard, dry cough, and Koplik's spots so typical that they were demonstrated to his mother. By April 7 he had the typical rash of measles, and his sister, aged 5¼, who slept in the same bed, was found by the mother to have Koplik's spots, and when seen by me the same evening looked miserable, with a temperature of 102° F. (38.9° C.), a hard cough, running eyes and nose, and photophobia. The following day a colleague saw the sister and confirmed the diagnosis of measles from the typical rash, which was becoming confluent when seen by me the next day. By April 10 the boy was much better, but the girl had striking circumoral pallor with the beginning of desquamation on the cheeks: her temperature was still raised to 102° F. (38.9° C.); she had a strawberry tongue, injected fauces, and enlarged cervical glands. On April 11 her measles rash was still present, but the fingers, palms, soles, and cheeks were now peeling, and superimposed on the measles rash was a typical scarlatiniform eruption. Granny, who had raised 16 children through every infectious fever without the help of a doctor, confidently diagnosed a combination of measles and scarlet fever—a diagnosis with which I concurred. On April 13 the boy was completely better, but the girl still had a temperature of 102° F. (38.9° C.) despite having started sulphonamides two days before. On April 15 she was much better and both rashes were fading.—I am, etc.,

DAVID JACKSON.

London, W.6.

Roseola Infantum

SIR,—Dr. E. L. McQuitty's article on roseola infantum (*Journal*, April 23, p. 1005) wisely draws attention to the most commonly occurring member of the exanthemata in infants under the age of 2. I have been noticing sporadic cases in my practice ever since the annotation in the *Journal* in 1950.[1] Dr. McQuitty mentions the paucity of references to the condition in the literature, but his most recent reference is 1950. Almost a page is given to it in my book[2] in the chapter on "Common Disorders Recently Recognized." In my opinion the importance of the recognition of this, and of other mild disorders encountered mainly in general practice, lies in the fact that exact diagnosis increases a general practitioner's confidence in himself and thus his patients' confidence in him.—I am, etc.,

DENIS CRADDOCK.

Plymstock, Devon.

REFERENCES

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2 Craddock, D., *An Introduction to General Practice*, 1953, p. 480. H. K. Lewis, London.

SIR,—In his paper on "Roseola Infantum" (*Journal*, April 23, p. 1005) Dr. E. L. McQuitty states: "In Britain, only Schlesinger (1937) refers to a few cases seen in London." That is not accurate. An outbreak in a maternity hospital was described in this country in 1949,[1] and was subsequently referred to in an annotation in your *Journal*.[2]—I am, etc.,

S. FREIER.

London, E.3.

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1 James, U., and Freier, A., *Arch. Dis. Childh.*, 1949, **24**, 54.
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Cross-infection in Hospital

SIR,—I have read with interest the articles by Dr. E. J. L. Lowbury (*Journal*, April 23, p. 985) and Dr. P. N. Edmunds and his colleagues (p. 990).

The reservoirs of antibiotic-resistant pathogenic staphylococci are: (1) Blankets on ward beds and waiting-room or casualty couches, or on theatre trolleys: these blankets should be washed every month in a solution of "lissapol" and then soaked in "fixanol" solution, and dried without further rinsing. (2) Pillows and mattresses: these should be treated with hot, moist, gaseous formalin in the hospital sterilizer every 10 days or every time the bed has a new occupant, whichever time is the shorter. (3) Floors, ledges, shelves, locker tops, table tops, etc., should be treated every day with the M.R.C. urea ninol mixture. (4) Hands: nurses' hands should be protected by thin rubber gloves when the napkins of infants are being changed, bedpans carried about or cleaned, dressings changed, etc. The "washing" of a nurse's hands is a farce. Gloved hands, however, can be "washed" effectively in water containing a substance like "milton." A nurse should wash up, dry her hands on a sterile towel, and then apply sterile powder to her hands and don dry thin sterile rubber gloves. Whilst wearing her gloves she can wash her hands dozens of times, with effect each time. (5) Nurses should wear an efficient mask and a sterile overall when at work. (6) All plates, cups, saucers, and other crockery, including drinking-glasses, knives, forks, and spoons, and any other cutlery should be boiled after every meal, in addition to ordinary cleansing procedures. (7) In addition to the above measures, the M.R.C. technique for dressing wounds should be adopted and strictly enforced. Septic plasters, septic burn wounds, and septic surgical cases should be segregated from clean cases; and these septic cases should not have their dressings changed or removed in an open ward or theatre used also for clean cases. A special theatre and ward should be kept for septic cases, and attendants working there should have their noses and throats swabbed at frequent intervals. If the attendants are found to be infected, the organism should be examined bacteriologically to find an antibiotic to which it is sensitive; the attendants should then be treated with this particular antibiotic until nose and throat swabs are clear. Emergency admissions and infectious cases should not be admitted to an open ward but placed in cubicles for 48 hours: the disposal of the case should then be reviewed.

Many of the measures recommended are described in an article in the *Lancet*, 1954,[1] and can be seen in action in a hospital in greater London.—I am, etc.,

FRANK MARSH.

Epping, Essex.

REFERENCE

1 Marsh, F., and Rodway, H. E., *Lancet*, 1954, **1**, 125.

The Changing Face of Medicine

SIR,—Mr. Clifford Kennedy's stimulating address (*Journal*, April 30, p. 1045) contains ideas of great importance, as well as a few crusty notions belonging to an age now departed and never likely to return. When, however, he says that the surgeon finds he is loath to undertake the risky case, I feel a challenge to be essential. If this is true the state of the profession is indeed inglorious. I don't believe it. Nor do I believe Mr. Clifford Kennedy when he says, "I have done it myself."

The responsibility of the doctor, physician or surgeon, is to make up his mind on the ascertainable facts and to take the action best suited to the patient under his care. No fear of possible legal consequences can alter that. The alternative is to resign and take up a job in a less responsible occupation. It is the hallmark of the doctor that he must decide. On his decision his own actions and those of many other persons—medical auxiliaries of all varieties—depend. The idea that the younger generation lacks courage and a spirit of adventure is common to all ages of history, and it is almost always untrue. The fact is that adventure

to-day is found on different pathways than in the first decade of the century because the history of our country and our calling has moved on in time.

As to the recent litigation, we are all concerned about it, and it behoves us to so order our affairs that negligent actions are as far as humanly possible eliminated. But the doctor who fails to act in the way he believes to be right when confronted with a patient needing his help, because of the fear of some unfortunate consequence to himself, should never have taken his medical diplomas in the first place. That is the central question. The case of the young resident who does not readily apply for a casualty post is in some respects not typical. Some courageous young doctors do undertake this type of post, but if others are more cautious there is reason in their position. For many years now we have been told that casualty cases should be seen by a competent accident surgeon having the F.R.C.S., and there are still hospitals where this arrangement has not yet been made. Perhaps one useful by-product of the recent High Court decisions is to compel hospital authorities to develop a more modern policy for their accident departments.

As for the attitude of the legal profession, doubtless relations could be improved. I feel, however, that there is a great deal to be said for their side of the story. High Court judges are usually men with great objectivity of mind and a sense of fairness. Perhaps they have their blind spots, but it would be presumptuous to suggest that their recent decisions were influenced by some lack of sympathy with the profession of medicine rather than a full consideration of the ascertainable facts laid before them. We must at all costs avoid an attitude which might suggest that we hold the view that the profession of medicine should stand above the law.—I am, etc.,

Bushey, Herts. PETER ROE.

Natural Childbirth

SIR,—I have read with interest the recent correspondence on natural childbirth. Being a mother who was considerably helped by this method, I feel that it cannot be encouraged enough in order that the next generation will not grow up with the tales of agony and suffering which used to surround childbirth. From the attitude of the previous generation, the result for me was a great fear of childbirth and the associated agony which I believed it to be (and I know I am not alone in this). I attended antenatal classes and practised relaxation throughout pregnancy, and together with the other mothers-to-be was told of the events of labour and the signs to look for through each stage. It was explained that labour was, as the word implies, very hard work. I must say I am surprised indeed that Mrs. Constance Lynn (*Journal*, April 2, p. 851) was not told to expect this. Through this education in the events of labour I entered into this great job of work free from the dreadful fear that had been with me since adolescence.

As we were told, less fear—less tension—less pain. Therefore my labour was by no means as painful as it would have been if I had not been instructed beforehand. Toward the end of a seemingly endless first stage, with fairly severe contractions, I found myself unable to relax. However, my husband (himself a doctor), who had practised natural childbirth with me, was able to remind me of the type of breathing I should be using. This was the greatest help to me at this difficult time of labour, and I feel that a woman in labour should be attended by some person experienced in natural childbirth. The father-to-be is generally considered to be a nuisance to all concerned; but if husband and wife have read and followed together the breathing and relaxation—as is often the case in natural childbirth—then he can be of considerable help to both mother and staff. A woman in labour should not be left alone to "get on with it"; and the midwife rarely has time to spare. Would not the husband be better employed in helping his wife than pacing the corridor outside?

I would be interested to know what Dr. Constance Beynon (*Journal*, April 9, p. 908) calls a normal birth. Is it one free from "abnormalities," in which the mother is unconscious at the moment of birth, and is introduced to her baby a half-hour or more later; or is it one in which the mother is conscious (remembering that the gas and air machine is at hand if required), feels her baby born, hears its first cry, and holds her baby a few moments after birth? For me, personally, the latter was possible; although the birth of my daughter—9 lb. (4 kg.)—was not completely normal owing to the necessity for an episiotomy, I was completely conscious throughout, and the knowledge that I was actually assisting when the moment of birth arrived is a joy I shall never forget. None of this would have been possible for me had it not been for the instruction I received beforehand in natural childbirth. I believe that, for this generation to have its babies naturally in the true meaning of the word, education during pregnancy is essential. Then, perhaps, the coming generation will grow up to know only tales of joy, instead of pain and agony. Surely natural childbirth must be encouraged.—I am, etc.,

Woking, Surrey. MARGARET MCLAREN.

SIR,—I have been following the correspondence on natural childbirth. My first child was born nine weeks ago, and as a member of a hospital staff I had attended all antenatal clinics, including classes for exercises. I had read widely around the subject of childbirth, and knew exactly what to expect in theory. I certainly had no fears, especially as I knew well the staff who would assist me in labour. I had also watched a normal delivery.

The onset of labour came suddenly, and the pain was so intense that within half an hour I was completely incapacitated. I was given trichlorethylene, which gave no relief, and subsequently gas and air, which was more helpful. Labour was short, under four hours, and uncomplicated, but it was from beginning to end so intensely painful that all my preconceived ideas on how I should assist were abandoned. Afterwards I felt, apart from physical exhaustion, an extreme disappointment that I had not been able to participate in the experience as I expected I should be able to. I hope I am the exception.—I am, etc.,

London, S.W.3. MARY B. DEW-JONES.

Aftermath of Hysterectomy

SIR,—With reference to the letters by "Doctor's Wife" and Dr. Katharina Dalton (*Journal*, April 30, p. 1093), I have had the opportunity to treat some 900 women suffering from uterine fibroids with haemorrhage since 1939. I used intrauterine radium for approximately three days. Apart from the rare submucous fibroids, treatment stopped bleeding at the following period or the period after.

Dyspareunia was the only ill-effect following the radium treatment. And the dyspareunia disappeared within six months on its own, and sooner when treated with vitamin E, which was better tolerated in these cases than artificial female hormones. The treatment needs only three days of immobilization in bed after a short anaesthetic, followed by no recovery period, so that the patient can return to her duties almost immediately. There were no other ill-effects, apart from temporary dyspareunia, and I wonder why this is not the treatment of choice in cases of subserous and intramural fibroids.—I am, etc.,

London, S.W.3. E. F. BLUMBERG.

Ban on Heroin

SIR,—I must join in the protest at the ban on the manufacture of heroin. We are only too familiar with the phrase "just as good" applied to substitute products—but who chooses the *ersatz* when he can obtain the genuine product? Clinical experience teaches, beyond the power of contradiction by laboratory experiments, that there is *no satisfactory* substitute for heroin in certain cases where pain relief is required. Surely, if abuse of a valuable drug by a small section of the community (and not even the British

community) is to be considered an adequate reason for imposing a ban on its manufacture, then both alcohol and tobacco should have gone long ago, whereas—quite properly—they have not been banned.—I am, etc.,

C. D. NEEDHAM.

Aberdeen.

SIR,—I fully concur with the opinions of your correspondents in the great disaster that would result by the imposition of a ban on heroin. This drug is the only effective weapon that the general practitioner possesses in combating the agonizing pain of patients suffering from advanced malignant disease. There are, of course, many other preparations on the market, but despite the claims of the manufacturers they are in no way so effective. Presumably the Government may have a very good reason for restricting the circulation of this drug, but surely a compromise could be reached whereby the procuration of heroin could be tightened up—for example, such as a consultant's signature on the prescription in addition to that of a registered general practitioner. The advisers of the Government on this matter are shouldering a heavy responsibility should this advice be implemented.—I am, etc.,

D. K. MULVANY.

London, W.1.

Alcoholic Addiction

SIR,—I have recently been consulted by general practitioners concerning the treatment of three cases of alcoholic addiction. The patients were ruining the family finances and causing great suffering to all those around them, but they refused to be admitted to hospital for treatment. I am writing this letter in the hope that those in power will be stimulated to recommend some form of legally compulsive treatment in such cases.

I am aware that it is against our tradition to interfere with the "private lives" of citizens, and I can well imagine people arguing that if a person wishes to drink himself to death he should have the right to do so. Others may argue that playing at roulette, betting on horses, and gambling on the Stock Exchange can equally ruin family finances and happiness. And yet I think most of us will agree that alcoholic addiction, both because of the size of its problem and of the peculiarly unpleasant suffering it causes in the family circle, stands in a class by itself.—I am, etc.,

I. ATKIN.

Basingstoke.

Telangiectatic ("Nape") Naevi

SIR,—The "nape" naevus (*Journal*, April 9, p. 913) is so extremely frequent that the question of heredity seems to be of no significance. This kind of naevus is known on the Continent as naevus telangiectaticus nuchae Unna, who in his *Histopathology of the Diseases of the Skin*[1] dealt extensively with this subject. He regarded these lesions as due to intrauterine pressure, and rejected Virchow's branchial fissure theory and the possibility that they may be connected with irregularities in the embryonic development.

These telangiectatic naevi are of what one could term an ontogenetic character, whilst other naevus forms—e.g., the blue, the "mongolian" naevi, and the face moles representing rudimentary sensory organs[2,3]—are of a distinctly phylogenetic nature.—I am, etc.,

ERNST SKLARZ.

London, W.1.

REFERENCES

1 Unna, P. G., *Histopathology of the Diseases of the Skin*, 1896. William F. Clay, Edinburgh.
2 Sklarz, E., *Derm. Wschr.*, 1926, **82**, 462.
3 *British Medical Journal*, 1938, **1**, 1164.

Hypodermic Injection Technique

SIR,—I have found the letters on the above subject both stimulating and helpful, especially when applied to injections of A.P.T. in small children where a painful episode with the doctor may give rise to a long-lasting aversion. I am not ashamed to confess that my own routine starts with a small bribe. I keep a stock of small, soft, brightly coloured sweets, and the health visitor who assists me distributes one to each mother. The mother holds the child on her lap and as I approach she pops the sweet into the opening provided for it. I grasp the upper arm gently at first with my left hand, then I increase the strength of my grip nearly to the point of producing pain and at this moment the needle is swiftly inserted. In future I shall combine this with Dr. John Richards's stretching technique (*Journal*, April 30, p. 1092). Between the pleasurable sensation of the sweet taste and the near-painful sensation of the firm grip the penetration of the sharp point is almost lost sight of. In most cases the episode passes without a cry and the small patient receives his meed of congratulation.—I am, etc.,

H. J. HOYTE.

Birmingham, 33.

Noradrenaline

SIR,—Your leading article on noradrenaline (*Journal*, April 9, p. 896) has the following sentence: "The greater pressor action of noradrenaline is explained by the fact that it constricts the vessels in the muscles as well as those in the skin and viscera, whereas adrenaline dilates those in the muscles."

This makes strange reading for any anaesthetist, even though he may be aware that similar observations, at least with regard to the action of adrenaline, have been made regularly by physiologists since Hoskins, Gunning, and Berry first made them in 1916.[1] An anaesthetist well knows that if, prior to such an operation as a thoracotomy, he infiltrates the heavy muscles which are to be cut with, say, 200 ml. of sterile water to which has been added 1 ml. of 1/1,000 adrenaline, bleeding will be greatly reduced. Again, those anaesthetists who, like myself, have attempted to reduce bleeding by infiltrating these muscles with 200 ml. of sterile water to which has been added 1 ml. of noradrenaline will know, from what they see and what they hear from the unhappy surgeon, that bleeding is greatly increased.

Perhaps the answer to this riddle lies in the dosage of these drugs; that a fairly high concentration of adrenaline such as that mentioned above will cause not dilatation but constriction of the vessels of skeletal muscles; and that the rise in blood pressure which resulted from infiltration of the noradrenaline solution was sufficient to increase muscular bleeding in spite of any constriction of the vessels which may have occurred.—I am, etc.,

W. N. VELLACOTT.

Worcester.

REFERENCE

1 Hoskins, R. G., *et al.*, *Amer. J. Physiol.*, 1916, **41**, 513.

Recovery from Chronic Lymphocytic Leukaemia

SIR,—In reply to Dr. F. A. Bearn's letter (*Journal*, April 23, p. 1031), I have looked up Gutmann's paper.[1] This seems to be one of the many doubtful cases in which the literature abounds. At no time was there any anaemia, and the highest number of white cells was 11,000. No myeloblasts were present, and the diagnosis of aleukaemic leukaemia would seem to require marrow biopsy for confirmation. No enlargement of liver or spleen was found clinically. The patient was followed up for two years only, and all the blood pictures except the last one were abnormal. Eleven years later Dr. Bearn found the patient to be suffering from "a typical lymphatic leukaemia." It would be interesting to have details of the blood picture.—I am, etc.,

MAX SCHOTT.

Bradford.

REFERENCE

1 Gutmann, B., *Amer. J. med. Sci.*, 1924, **167**, 718.

Spontaneous Haemopneumothorax

SIR,—The most interesting account of spontaneous haemopneumothorax by Colonel A. J. Clyne and Wing-Commander F. H. D. Hutter (*Journal*, April 30, p. 1058) recalled to my mind the only case I ever saw in almost 20 years of general practice. This occurred early in 1946 when I was a medical officer attached to a field dressing station in Germany.

The patient was a private soldier whom I admitted to our casualty reception station in a state of near collapse, and who complained of sudden onset of severe pain in the right side of the chest. There was no history of injury, nor

indeed of any previous illness. The pain rapidly increased in intensity and was accompanied by dyspnoea, pyrexia, and rapid pulse. It was most severe even on slight movement and on inspiration. I made a tentative diagnosis of spontaneous pneumothorax, but soon after decided that it must be a haemopneumothorax on account of increasing restlessness, pallor, air hunger, and other phenomena of shock. He was too ill to be moved, so, employing the limited facilities at my disposal for treatment of such a case, I fitted up an underwater intercostal drainage apparatus. With the help of this and with the administration of a continuous intravenous saline drip, together with adequate sedation and penicillin cover, the patient improved dramatically and out of all recognition from day to day. As a result I was able to transfer him (in accordance with Army regulations) on the fourth day to a Canadian general hospital in Holland.

I visited him on two occasions there, and found that the diagnosis had been confirmed radiologically, that several pints of blood had been aspirated, and that he was greatly improved. It was thought that the tubercle bacillus was the causative agent in this case. He was later drafted back to England and unfortunately I lost trace of his subsequent progress on account of my own demobilization.—I am, etc.,

Glasgow, S.1. M. FREEDMAN.

Cyst Formation

SIR,—I was interested to read Mr. A. G. Rutter's report (*Journal*, April 16, p. 951) of another case of gross cyst formation following cutis graft repair of an inguinal hernia. During and shortly after the war a series of inguinal herniorrhaphies was performed by this method in this hospital, and in 1952 we reported two cases of gross cyst formation with survival of hair follicles and sweat glands.[1] Since that time the total number of our cases in which this complication has occurred has risen to over half a dozen, including one in which the cyst formation was bilateral. It is worthy of note that in none of these patients was there any recurrence of the hernia. We have therefore been encouraged to carry out preliminary experiments in freeze-drying redundant skin taken from patients undergoing umbilical herniorrhaphy with the object of killing the epithelial elements and enabling the cutis to be stored and used safely for hernial repair in other patients.

Specimens have been taken with aseptic precautions and cultures have been negative after the freeze-drying process. We have found, however, that the cornified layers of the skin assume a rather unpleasant white appearance, and it may be that the superficial layers should be removed with a dermatome before processing. The process of rehydration is also rather tedious. If these problems could be overcome it might be possible to obtain all the advantages of cutis grafting without the disadvantages which are becoming increasingly obvious.—I am, etc.,

Liverpool, 9. NORMAN GIBBON.

REFERENCE

1 Gibbon, N. O. K., and Lothian, K. R., *Brit. J. Surg.*, 1952, **39**, 501.

Coal-workers' Pneumoconiosis

SIR,—The article by Drs. J. C. Gilson and G. S. Kilpatrick (*Journal*, April 23, p. 994) is extremely informative and will be helpful to those attempting to deal with respiratory cripples from the coalfields. There are thousands of ex-miners in London who left the pits during the great mining depressions, and many of these are slowly dying, often without compensation, from the effects of dust inhalation. It would be helpful to those doctors who have to urge men to continue working to know the exact definition of "dust-approved conditions." Can we know the scientific evidence on which it is asserted that men can work, for many years, without harm in such an atmosphere?

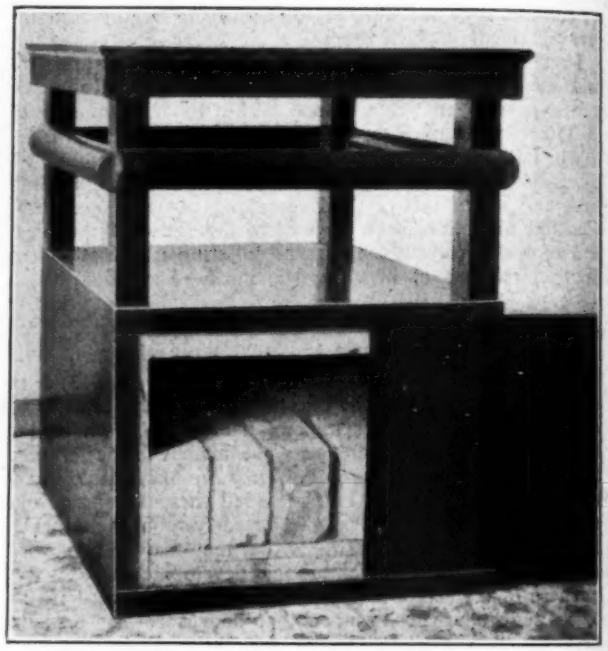
As far as I can discover from clinical observation there is little difference in symptoms from pneumoconiosis and bronchitis and emphysema. Certainly few miners would know the difference, and they believe the cause is the same. A practitioner relative of mine found that in his colliery practice, since the war, over 40 miners and ex-miners had died from chronic chest disease; of these, two only had been certified as having dust disease. National statistics are now available for the morbidity from chronic bronchitis. The National Coal Board must know the incidence in the mining community. Can these figures be published so that we can have realistic discussions on the effect of work on the miners' respiratory capacity?

Finally, Sir, may I urge that, since complicated pneumoconiosis is almost certainly due to dust and tuberculosis, we eliminate tuberculosis from our coalfields forthwith. Mass radiography, annually, of miners and relatives, as in the Rhondda, would discover infectious cases. Treatment can now be made available universally and one at least of the miners' hazards would be abolished. Knowledge comes, but application lingers.—I am, etc.,

London, N.W.10. HORACE JOULES.

An Aid for Parkinsonism

SIR,—This is a photograph of an appliance I had made for a case of post-encephalitic parkinsonism, and it may be of interest to others. The lady had reached the stage in which she could sit down, but was unable to get off her chair without assistance. She lives at home with a sister who is out all day. Consequently she had to sit by herself from morning to night, and her muscles were becoming stiffer and weaker. She was unable to go out by herself, and had to be pushed in a bath-chair.



The appliance consists of a box, closed except at one end, which has a sliding panel. The box is filled with bricks to make it immovable. Above the box is a banister rail. By hooking her fingers around the rail the patient can pull herself on to her feet with ease, and, after steadying herself, can walk without any trouble. She has been using the appliance for the past three months, and is now more active than she has been for the last seven years. She goes out walking by herself, and says she can manage a quarter of a mile without distress. She is much more confident and self-reliant, goes shopping and to church, and is very much less dependent on her sister.

She uses the tray on top for her meals and the top of the box as a container for books, newspapers, etc. The box measures 3 ft. by 2 ft. at the sides and 2 ft. by 2 ft. at the ends. The superstructure is 1 ft. in height.—I am, etc.,

London, N.14. W. SIMPSON.

Coma Following Dental "Gas"

SIR,—In a questionary that I recently sent to a random sample of the dental surgeons of the United Kingdom I asked: "Have you ever known a patient who did not immediately regain consciousness after gas but remained unconscious or stuporous for half an hour or more?" From the replies so far received I feel able to report that at least one in three of all dental surgeons who make extractions under nitrous oxide would answer "yes" to this question; many could relate several such cases, and the coma often lasts longer than half an hour. The nitrous oxide is almost always given with oxygen, though, of course, the oxygen is very much restricted.

One report tells of a child of 6 who was anaesthetized for the extraction of a single deciduous tooth. The anaesthetist was a doctor of outstanding ability, experienced in this kind of work. This child took the gas well and the extraction was quickly made. Apart from the restriction of oxygen that is always a feature of this method, it is impossible to suppose that there was any fault or lack of skill in the way in which the anaesthetic was given. Yet the child went into coma and remained unconscious for several days. After this, cerebral function returned very gradually so that it was many weeks before the child could be discharged from hospital.

It is possible that such desperate examples of this syndrome are very rare, but in view of the apparent frequency of its occurrence in lesser degree, and in the hope of discovering its cause, nature, and incidence, I think it worth while to direct the attention of your readers to it.—I am, etc.,

London, S.E.1. J. G. BOURNE.

POINTS FROM LETTERS

Damages for Hot-water Bottle Burns

Dr. F. E. GRAHAM-BONNALIE (Exeter) writes: With reference to your medico-legal report (*Journal*, April 2, p. 856), now that it is taught that coolness and not heat is the better treatment for shock, could not hot-water bottles be dispensed with altogether?

Hospital Improvements

Miss OLIVE MATTHEWS (The Old Forge, Coaley, near Dursley, Glos.) writes: A few years ago I brought out a booklet called *Hospital Improvements*—how to improve the daily life of the patient in the ward. This is illustrated, and deals with topics like the early morning wash, noise, visiting hours, and bedside lockers. It received many kindly reviews, including your own (*Journal*, October 14, 1950, p. 879), and since then has reached hospitals in at least 32 different countries and colonies of the world—more than 2,000 copies have gone, but over 300 remain. I am now willing to give them away to the reader who will send me fourpence to cover the cost of postage and envelope.

Night Cramps

Mr. RICHARD WARREN (Weston-super-Mare) writes: I have lately seen a good many letters in your *Journal* on the subject of cramps. I have had attacks of cramp far too often for my liking during the past 60 years or more, sometimes very painful indeed, until I learned how to cope with them. It occurred to me that contraction was reported to produce sarcolactic acid in muscle. I wondered in my simple brain if excess of sarcolactic acid might be the cause of cramp. If so, the obvious course was to neutralize the acid *quam celerrime*. The most rapidly diffusing alkali I knew was ammonia, which I took in the form of sal-volatile, or later, because they were more easy to carry, soda-mint tablets, which contain a small amount of ammonium carbonate. The effect on me was magical, complete relief in a very few minutes or even seconds. You may say psychical, or wishful thinking, but it has never failed in my case, and has saved me hundreds of attacks of severe pain. I have put many friends and patients up to this little tip, usually, so far as I remember, with success. Several indeed carry some tablets with them habitually.

Hair-grips

Dr. IVOR HOOPER (Dublin) writes: In my opinion hair-grips should have metallic blunt ends for better usefulness and greater safety, and I hope that this suggestion will catch the eye of the appropriate manufacturers.

Obituary

W. G. MUMFORD, O.B.E., M.B., F.R.C.S.

Mr. W. G. Mumford, consulting surgeon to the Royal United Hospital and the Royal Mineral Water Hospital, Bath, died at Eastbourne on April 27. He was 84 years of age.

Wilfred George Mumford, who was born on June 14, 1870, was a medical student at Guy's Hospital, where he qualified M.R.C.S., L.R.C.P. in 1895. For the next few years he remained in London, studying for the M.B., which he obtained in 1902, passing the final examination with honours in medicine. By this time he had decided on a surgical career and in 1903 he took the diploma of F.R.C.S. Mumford elected to settle in practice at Bath, which he did soon after obtaining his Fellowship. His connexion with the Royal United Hospital began in 1905, when he was appointed anaesthetist, and five years later he became assistant surgeon. The status of full surgeon followed in due course, and when he retired he was appointed consulting surgeon. During the first world war he served in the R.A.M.C. and for some time was employed as a surgical specialist at the military orthopaedic hospital at Southmeads, Bristol. He attained the rank of major, and was appointed O.B.E. in 1919 for his war services. After the war his surgical practice in Bath became a large one and he was appointed surgeon to the Royal Mineral Water Hospital, to the Ministry of Pensions orthopaedic hospital at Bath, and to the Bath and Wessex Children's Orthopaedic Hospital at Combe Park.

When the Annual Meeting of the B.M.A. was held in Bath, Mumford, who was honorary secretary of the Bath Division at the time, was appointed local general secretary of the meeting. It so happened that the incoming President, Dr. F. G. Thomson, was prevented by illness from attending the various functions, and the local executive committee appointed Mumford to take his place. Mumford rose to the occasion with conspicuous success and enhanced his already high reputation. In the following year he served as one of the vice-presidents of the Section of Surgery at the Annual Meeting at Nottingham, and he was also elected president of the Bath Division. In 1931–2 he was president of the Bath and Bristol Branch. His great characteristics were conscientiousness and scrupulous attention to detail, and these, added to his striking and handsome presence, made him an impressive figure.

Mumford moved to Willingdon, in Sussex, in 1934, when he retired from active surgical work. He is survived by his widow and one son and two daughters.

P. K. DIXON, M.D., F.R.C.S.I.

Dr. P. K. Dixon, surgical specialist at the Government African Hospital, Lusaka, Northern Rhodesia, and lecturer in surgery in the African Medical School, died at Lusaka on April 21 at the age of 56. Before taking up these appointments early in 1953 he had done outstanding work as a medical missionary in the Luapula valley of the Belgian Congo for over a quarter of a century, work which he gave up only on account of ill-health.

Patrick Kerr Dixon was born on September 21, 1898, the son of the late Professor A. Francis Dixon, who was dean of the Faculty of Physic at Trinity College, Dublin, from 1924 until his death in 1936. From St. Andrew's

College, Dublin, Patrick Dixon entered Trinity College in 1916, but he interrupted his studies there to serve with the Royal Garrison Artillery in France, being mentioned in dispatches. He returned to Trinity College in 1919 and graduated in science in 1922, being awarded first-class honours in mathematics and experimental science and a gold medal in natural science (his father as a student also won the gold medal). In 1924 he obtained his medical degrees, with honours, and in the same year took the D.T.M.&H. of the English Royal Colleges. He proceeded to the M.D. in 1925, and became a Fellow of the Royal College of Surgeons in Ireland in 1934. After graduating in medicine he held house appointments at the Royal Alexandra Hospital for Sick Children, Brighton, and Hove General Hospital, and then, in 1926, he joined the Garenganze Evangelical Mission in the Belgian Congo. He was twice married: first, in 1926, to Miss Olive Archer, who died in 1927, and second, in 1934, to Miss I. H. Russell, who, with one daughter, survives him.

G. P. N. writes: Dr. P. K. Dixon was a man of outstanding ability, and this was coupled with a humility and charm of character which made him many lifelong friends. He had many severe trials. He lost his first wife soon after her arrival in the Congo; he was severely mauled by a lion; and subsequently he suffered prolonged illness. In spite of these misfortunes he did magnificent work in the Congo over a period of nearly 30 years, work which included the founding of a hospital at Chibambo, on Luapula river, a hospital which now stands as a monument to his labours. Trachoma and eye diseases in general are among the main problems of the Luapula valley: in order to fit himself to deal with these Dixon spent six months studying ophthalmic diseases under Sir Henry Holland in India in 1929, and later his own hospital became a renowned centre for the treatment of eye diseases. In recognition of his long and meritorious services he was decorated by the King of the Belgians.

WILLIAM BURRIDGE, D.M.

Dr. William Burridge, who was professor of physiology in Lucknow University for many years, and later dean of the faculty of medicine and principal of King George's Medical College, died at Dartford, Kent, on April 21. He was 69 years of age.

William Burridge was born on July 1, 1885, the son of Mr. John Burridge. He entered Christ Church, Oxford, as an exhibitioner in 1904, and continued to study and teach physiology after taking his B.A. degree. He added to the brilliance of his scholastic record by winning the Dixon Research Scholarship and the Mark Quested exhibition in 1909. The award of the Rolleston Memorial Prize for original research in physiology and pathology followed in 1912 and the Radcliffe Prize in 1917. Receiving his clinical training at Guy's Hospital, he graduated B.M., B.Ch. in 1916, and some twelve months later entered the R.A.M.C. for service in the first world war, in the course of which he was employed at Malta—an island to which he was attracted more than once after his return to civilian life—and at the Swanage military hospital.

In 1922 Burridge proceeded to the D.M., and went to King George's Medical College, Lucknow, as professor of physiology. Later he became principal of the college and dean of the faculty of medicine, and he served also as a member of the United Provinces Medical Council. In 1933–4 he was president of the United Provinces Branch of the British Medical Association. He left India in 1938, and since the end of the second world war had spent his life almost equally between Malta and Oxford. He had a brief term of office as dean of the faculty of medicine in Rangoon University in 1946–7, and in 1954 he obtained an appointment at Liaqhat Medical College, Hyderabad. Besides contributing many short papers to scientific journals, Professor Burridge was the author of *Excitability: a Cardiac Study* (1932); *The New Physiology of Sensation* (1932); and *A New Physiological Psychology* (1933).

GEORGE DOUGAN, M.D., D.P.H., M.P.

The death took place on April 7 at his home at Portadown of Dr. George Dougan, Member of the Parliament of Northern Ireland since 1941. He was 73 years of age.

The son of the late Dr. G. Dougan, of Portadown, George Dougan studied medicine at Trinity College, Dublin, where he graduated M.B., B.Ch. in 1906. He proceeded to the M.D. in the following year and took the D.P.H. of the Irish Royal Colleges in 1908. After graduation he joined his father in practice and soon established himself in the confidence of his patients, who came to love him and to have absolute faith in his efficiency as a doctor. After service with the R.A.M.C. in the first world war he returned to Portadown, where he became an enthusiastic member of the British Medical Association, seldom missing a meeting of the Portadown and West Down Division, of which he was chairman in 1922. He also represented his constituency at five Annual Representative Meetings from 1931 to 1941. His colleagues, by whom he was held in very high esteem, often sought his opinion on every kind of medico-political problem and highly valued his advice. In 1941 Dr. Dougan was returned unopposed as the Member of the Northern Ireland Parliament for Central Armagh, and he continued to hold the seat until his death, having defeated his Commonwealth Labour opponent at the 1945 General Election. He was also a deputy lieutenant for Co. Armagh, coroner for northern Armagh, and a member of the General Synod of the Church of Ireland. In the world of sport, too, he was a prominent figure. At the time of his death he was the oldest member of the Portadown Boat Club, and he was a past captain of the golf club. He was a Serving Brother in the Venerable Order of St. John of Jerusalem, and a foundation member and president of the local Rotary Club. By his passing Portadown has lost a fine doctor and a noble character who will be long remembered by his patients and fellow doctors alike. He is survived by his widow, formerly Miss Mary McDonald, and two sons, Dr. George Dougan, junior, who has been associated with him for some years in the practice, and Dr. Donald Dougan, who lives in Canada. A third son, Lieutenant-Colonel Hampton A. Dougan, died on active service in the second world war.—D. L. H.

Dr. G. A. RORIE, who was in practice in Dundee for more than 40 years until his retirement in 1952, died at Broughty Ferry on March 23 at the age of 78. George Arthur Rorie was born on August 2, 1876, the son of Dr. James Rorie, physician-superintendent of Dundee Royal Asylum. He was educated at Dundee High School and at Edinburgh University, where he graduated M.B., Ch.B., with distinction, in 1898. Developing his father's interest in mental health work, he held the post of assistant medical officer at Edinburgh Royal Asylum under Dr. T. S. Clouston, and later gained further experience as clinical assistant to

Dr. Hughlings Jackson at the National Hospital for Nervous Diseases, London. In 1898 he obtained the certificate of the Royal Medico-Psychological Association, and thereafter held posts at the Cumberland and Westmorland Mental Hospital, Carlisle, and at Herrison Hospital, near Dorchester, where he worked for ten years. He proceeded to the M.D. in 1906. In 1912 he decided that general practice held more interest for him and he returned to Dundee, obtaining the D.P.H. of St. Andrews in the following year. He soon attracted a large practice, which he conducted for the next forty years, broken only by service in Egypt in the first world war, when he held a temporary commission in the R.A.M.C. In Dundee he took a keen and active part in the local affairs of the British Medical Association, and was president of the Dundee Branch in 1931–2, chairman of the Dundee Division in 1947–8, and a member of the Scottish Committee from 1945 to 1949. His chief recreations were walking and climbing, and when over 70 he was still able to climb a Cuilin. His retirement was forced upon him, much against his will, by the onset of glaucoma, but he continued to walk several miles daily until the day before his death. He is survived by his widow, a daughter, and three sons, one of whom is a psychiatrist in Dundee.

The death occurred at his home in Northampton on March 28 of Dr. STEPHEN ROWLAND, who was medical officer of health for Northampton County Borough from 1926 to 1946. Aged 82, he had been seriously ill for some months. He was perhaps unique among medical officers of health in holding the square-rigged master's certificate. Stephen Rowland was born in Blackburn, Lancashire, on September 1, 1879. He went to sea as an apprentice in a barque, the *Muncaster Castle*, and served five and a half years. In 1897 he passed his second mate's examination and joined the *Wray Castle*, a full-rigged ship. Two years later he passed as first mate and in 1901 the square-rigged master's examination. Soon after obtaining his master's certificate he entered Edinburgh University as a medical student, and graduated M.B., C.M. in 1907. Taking the Cambridge D.P.H. in 1909 with a career in the public health service in view, he was appointed senior assistant medical officer at Monsall Isolation Hospital, Manchester, in the following year, and then, in 1912, he became medical officer to a waterworks at Birchinlee, a small place in North Derbyshire not far from Sheffield. He left this appointment to serve throughout the first world war in the R.A.M.C., attaining the rank of captain. After the war he secured a post at the Northampton Tuberculosis Dispensary. In 1924 he proceeded to the M.D., and two years later succeeded the late Dr. J. D. McCrindle as medical officer of health, school medical officer, and chief tuberculosis officer of the county borough of Northampton, an appointment he held until he retired in 1946. He was president of the Northamptonshire Branch of the British Medical Association in 1934. He never lost his love for sailing ships, and his skill in modelling them was exceptional. Four of his models are in the permanent collection at Edinburgh Museum, while his last—one of the largest he made—is at the Royal Maritime Museum, Greenwich. He leaves a widow and two sons, Flight Lieutenant Stephen Rowland and Lieutenant-Commander Bernard Rowland, R.N., and a grandchild.—C. G. P.

The profession in West Lothian generally, and in Bo'ness particularly, has suffered a severe loss through the tragic death on April 12, after a disastrous motor accident, of its senior active practitioner, Dr. W. A. SHAFTO. His wife and son were seriously injured at the same time. A native of Forfarshire, William Alexander Shafto was born on September 27, 1886, and studied medicine at Edinburgh University, where he graduated M.B., Ch.B. in 1910, proceeding to the M.D. in 1913, in which year he also took the D.P.H. He settled at Bo'ness in 1914 as assistant to and, later on, partner with Dr. John Graham, whose death left him in full control of the practice. During the first world war, Dr. Shafto served with the R.A.M.C. in the Middle East, becoming medical officer at Bagdad and receiving a mention in dispatches. On demobilization he returned to Bo'ness and settled down to consolidate the practice. In this he was eminently successful. He became medical officer to the Post Office, and later on he was appointed medical referee to the sheriff court at Linlithgow for West Lothian cases under the Workmen's Compensation Act. He was a very sound and wise practitioner and a real friend to all his patients. Although he did not play any active part in public work, he did take his full share in the deliberations of the West Lothian Local Medical and Panel Committees. He was a very keen and competent golfer, with, at his best, a low single-figure handicap. The deepest sympathy of all who knew him, fellow-practitioners, patients, and friends, will be extended in full measure to his widow, his daughter, and his son.—H.

A. McW. G. writes: There are few houses in Bo'ness and the surrounding districts of West Lothian which have not been penetrated by the shadow of sorrow attending the tragic death of Dr. W. A. Shafto. Few men were so privileged as was he in the possession of so much of that inner flame which radiates a deep, confident, satisfying peace, eclipsing all personal care and the shadows of adversity. This presence, this aura of peace, was in him a composite of a life of learning, meditation, and service to people with whom he felt deeply in all his senses. His essential goodness was a fountain from which the whole community gained elevation. Apart from the professional sphere, in which he was so notable, Dr. Shafto's interests lay in his family, his garden, his books, of which Shakespeare was most favoured, his dog, which was almost as well known as his master, and lastly, but by no means least, his golf. He is survived by his wife, who is slowly recovering from serious injury, and by a son and a daughter, who is also a medical graduate of Edinburgh University.

The news of the sudden death of Dr. W. J. DAWSON at Cheltenham on April 17, at the early age of 33, has deeply shocked his many friends. Descended from farming stock, William John Dawson was born on May 2, 1921, and educated at Fraserburgh Academy and at Aberdeen University, where he graduated M.B., Ch.B. in 1943. After holding hospital appointments in Wolverhampton, in Grantham, and at the North Middlesex Hospital, he was in general practice at Slaithwaite, Yorkshire, before settling at Cheltenham in 1948.

I. D. I. writes: Although of a retiring disposition, Johnny Dawson brought many gifts to those he honoured with his friendship—a delightful sense of humour, love of serious disputation, a joy in quiet conviviality, and a ready wit. He had a full and enjoyable student career, and his influence, though unobtrusive, was real and valuable and felt in many fields of activity. He was an accomplished though occasional artist, producing caricature or set design with efficiency, while music was an abiding interest. Nor, despite his mitral lesion, of which he was aware, was he averse from games, playing hockey especially with enjoyment. At Cheltenham he readily established himself in the respect and esteem of colleagues and friends, who appreciated the integrity and idealism behind his modest exterior. In recent months it seems that his illness worsened and he was to have undergone cardiac surgery, but this was not to be. So we, who mourn the loss of one whose good companionship we have been privileged to share, extend our deepest sympathy to his widow and her children in their grievous sorrow.

Dr. FREDERIC LONGHURST, formerly anaesthetist to St. George's Hospital and the Grosvenor Hospital for Women, died at his home in Fowey, Cornwall, on April 19, aged 79. Frederic William Longhurst, whose father was Dr. A. E. Temple Longhurst, of Eaton Square, London, was educated at Westminster School and St. George's Hospital, where he qualified M.R.C.S.,

L.R.C.P. in 1900. After holding resident appointments at the Worcester General Infirmary and at the Hospital for Sick Children, Great Ormond Street, he went into general practice in London, living in Hobart Place, London, S.W.1. His first appointment as an anaesthetist was to the Gordon Hospital, and later he became anaesthetist to St. George's Hospital, the Grosvenor Hospital for Women, and the General Lying-in Hospital in Lambeth. Frederick Longhurst had a most lovable disposition, and he obtained fame in London as the very handsome doctor whose patients were never sick after receiving an anaesthetic at his hands, which certainly was an unusual feat in those days of ether and chloroform anaesthesia. He took a very active interest in the medical school at St. George's, and was a keen lawn-tennis player until his arthritis drove him off the courts. Very young in heart and refusing to be incapacitated by this disability, he courageously submitted himself late in life to a severe surgical operation, and he was able to enjoy a happy and reasonably active life to within a day or two of his death.

Medical Notes in Parliament

DOCTORS' RIGHT TO PRESCRIBE

A debate on the social services which occupied the House of Commons on May 4, like all the debates in the last week of a Parliament now dissolved, had a marked election flavour, and was for the most part a compound of comment on party manifestos and a refurbishing of views on Health Service expenditure and changes recently made in pension and benefit rates.

Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) castigated the Government for what she called their callous disregard of the Phillips Report on the economic and financial problems of the provision for old age and their niggardly treatment of recipients of national assistance. She then came to the 1s. prescription charge, and asked whether it should be continued in view of the hardship it imposed and the administrative burden entailed. She quoted in support the resolution of the B.M.A. conference at Cardiff, and some of the speeches calling it a major retrograde step and asserting that because of it children in large families were not receiving proper treatment.

Unnecessary Expense in Prescribing

Then she came to drugs, and engaged the Minister in a duel on the doctor's right to prescribe. About £50m. a year was spent on drugs, she said, and about 30% of this went on proprietaries. How could the Minister allow this huge sum to go to swell the profits of the big drug houses when he had to be so cheese-paring in other directions? He had done everything except take strong action. He should refuse to sanction unnecessary expense in prescribing where there was a satisfactory alternative. Only the hypochondriacs and those in big business making colossal profits would object, and the taxpayers would be delighted.

Mr. MACLEOD said that what she was asking was that the Minister of Health should take powers to tell a doctor that he must not prescribe something that he thought best for the patient. That was the fundamental difficulty in the proposal. It would no doubt be desirable in many cases if doctors would prescribe what was in the *National Formulary*. But if a doctor, for whatever professional reasons, thought it right to prescribe a certain drug, did Dr. Summerskill think it proper to forbid him to prescribe it?

Dr. SUMMERSKILL said that the Minister already exercised certain powers. His officials examined a cross-section of prescriptions, and if they concluded that a doctor was guilty of excessive and expensive prescribing the doctor was informed. The Minister had established the principle. What he was asking her was a question of degree.

Mr. MACLEOD said that he understood Dr. Summerskill's proposal would take that discretion away from the doctor.

Mr. JAMES GRIFFITHS (Llanelly, Lab.) interposed to give the case of a constituent who believed that a certain proprietary medicine was the best for him, and had been receiving it on a Health Service prescription from his doctor. Then it was stopped. He wrote to the Minister, and it was clear from the reply that it was stopped because it was thought that other prescriptions would be of equal value.

Mr. MACLEOD said it was suggested to doctors that certain asthma preparations were not of proved therapeutic value. But if in his discretion a doctor still decided that they should be prescribed it was quite legitimate.

Dr. SUMMERSKILL said the Minister was on a very bad wicket. In asthma there was a nervous element, and a patient might feel convinced that a certain preparation was the best for his complaint. On this question she would say that the doctor had probably a right to prescribe it, because he was prescribing for a nervous patient who had faith in that particular drug. She was shocked to learn that he could tell a doctor that he could not prescribe something for a nervous patient. The Minister did not know what his policy was or should be. Obviously, where there was a satisfactory alternative—in the case quoted it was not satisfactory—the doctor should be told that he must prescribe it.

Mental Hospitals

Continuing, Dr. Summerskill spoke of long waiting-lists for operations of a simple kind, and asked if the Minister thought he was justified in allowing beds to be earmarked for fee-paying patients. About mental hospitals there had been alarming questions. They had heard about overcrowding and shortage of nurses, and these, combined with the activities associated with mental patients, had presented a horrifying picture reminiscent of Hogarth's "Bedlam." Yet there was no pressure group on behalf of mental patients. Why? Often because mental patients filled people with fear; there were few visitors to see the conditions; and there were even some doctors who were inclined to regard money spent on mental disease as wasted because of the doubtful return in dividends in terms of healthy, useful people to the community.

Mr. OSBERT PEAKE, Minister of Pensions and National Insurance, answered the point about the Phillips Report. He said there were a number of important questions still before the National Insurance Advisory Committee. It was fairly clear that, arising from these, and from the Phillips Report itself, there would have to be legislation amending the National Insurance Scheme. But he thought they built fairly well in 1946, and he would be reluctant to introduce changes just for the sake of change.

Mr. MACLEOD in the interval had sent for the letter he wrote to Mr. Griffiths, referring to the prescribing of a proprietary medicine for asthma, and quoted from it:

> "I am advised that [this medicine] is not therapeutically superior to the standard preparation. . . . On the other hand, it is much more expensive, and, believing as I do that doctors would not wish the funds available for the Health Service to be spent unnecessarily, I have asked them not to prescribe it. I cannot prohibit them from doing so, and, while I hope the doctors generally will comply with my request, I am sure they quite understand that they are still free to prescribe whatever they think necessary in the individual case."

On the advice of the Cohen Committee, he said, it was from time to time suggested to doctors that they should not prescribe a certain drug, but he did not interfere in any way—he would regard it as improper to do so—with the clinical freedom of doctors, if they so wished, to prescribe a particular drug in relation to a particular patient.

Mr. GRIFFITHS apologized for his memory having been at fault, but asked if there was any question of doctors being charged or questioned about prescriptions afterwards.

Mr. MACLEOD said that if a doctor chose to go against the advice given him he would not be surcharged for that. It was possible—a different point—that his prescribing as a whole might be looked at, and one element might be the over-prescribing of one particular drug. The difficulty he was in was that he could not see how what Dr. Summerskill

had in mind, relating to the prescribing of ordinary substances on the list, could be achieved without interfering with the clinical freedom of doctors.

Private Beds

On the question of private beds, he said that about 1% of beds in the Health Service were private, and about one-third of those at any given time were occupied by non-paying patients, on the grounds of medical urgency or to see that the beds were filled. It was incredible that the Labour Party must concentrate its only practical proposal on two-thirds of 1% of the beds. The proposal was a breach of pledges by Socialist Ministers, and a breach of faith with millions of people who paid into contributory schemes so that they might have some privacy in hospital. He would believe in the proposal when the Opposition practised what they preached, and he saw members of the party who were ill going into the public wards of hospitals.

On the cost of drugs, he said the total bill was about £43m. (not including hospitals), and within that sum £24m. was due to proprietary medicines. Many of the greatest discoveries had been made by private firms—the antibiotics were an obvious example—and the industry had an important export trade. He was in close touch with the Association of British Pharmaceutical Industry, and they had been working out formulas which would enable a satisfactory guide about suitable profits to be reached.

As to mental beds, the mental hospitals had no waiting-list, but on the mental-deficiency side there was a waiting-list of about 7,000. There were plans for the construction of 6,000 more beds in progress, and in addition the substantial hospital building programme recently announced would include a share for the mental-deficiency side.

Nuclear Radiation Committee

The membership of the committee appointed by the Medical Research Council to prepare a report on the medical aspects of nuclear radiation was announced on May 4 and is as follows:

Sir Harold Himsworth, F.R.S. (chairman), Secretary of the Medical Research Council.

Sir Ernest Rock Carling, Consultant Adviser, Ministries of Health and Home Office (Civil Defence), and member of the Health Policy Committee of the Atomic Energy Authority.

Sir John Cockcroft, F.R.S., Director, Atomic Energy Research Establishment.

Professor A. Haddow, Director, Chester Beatty Research Institute.

Dr. J. F. Loutit, Director, Medical Research Council Radiobiological Research Unit.

Professor K. Mather, F.R.S., Professor of Genetics, Birmingham University.

Professor W. V. Mayneord, Professor of Physics applied to Medicine, London University.

Professor P. B. Medawar, F.R.S., Professor of Zoology and Comparative Anatomy, University College, London.

Professor J. S. Mitchell, F.R.S., Professor of Radiotherapeutics, Cambridge University.

Professor L. S. Penrose, F.R.S., Galton Professor of Eugenics, University College, London.

Sir Edward Salisbury, F.R.S., Director, Royal Botanic Gardens.

Dr. F. G. Spear, Deputy Director, Strangeways Research Laboratory, Cambridge.

Professor J. R. Squire, Professor of Experimental Pathology, Birmingham University.

Professor C. H. Waddington, F.R.S., Professor of Animal Genetics, Edinburgh University.

Sir Lionel Whitby, Regius Professor of Physic, Cambridge University.

Professor B. W. Windeyer, Professor of Radiology (Therapeutic), London University.

Lists of Patients for Voting

The MINISTER OF HEALTH made his promised statement on the use of doctors' lists for the purpose of the postal vote on May 3. He said that he had studied carefully the documents sent him by Mrs. B. Castle (Blackburn, West, Lab.), who had said that pressure was being used by local Conservative associations on doctors to send the names and addresses of sick, blind, and aged persons for the purposes of the postal vote.

Mr. MACLEOD stated that it was desirable that everyone should be aware of their right to a postal vote, and equally important that any information given should be made available to all political parties who asked for it. There was nothing wrong in responsible citizens, doctors or others, bringing to the notice of those concerned, whatever their politics, their rights as postal voters. On the specific question about extracting patients' names from doctors' lists, he would not expect information concerning doctors' N.H.S. patients, which was normally regarded as confidential, to be disclosed for some entirely different purpose. He was sure that doctors understood the position, and that no special communication was necessary.

Chest Disease on Tyneside

Mr. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health on May 2 whether he was aware of the high level of chest diseases, particularly tuberculosis and bronchitis, on Tyneside compared with the rest of the country; and whether he would give all possible support both to research into causes and to provision of adequate facilities for treatment. Mr. IAIN MACLEOD replied "Yes." There was a particular research project in hand dealing with bronchitis in Newcastle. He understood the regional board had a number of plans for additional chest clinics, and he thought it was intended to give priority to Gateshead, where the problem was perhaps more serious than elsewhere.

Poliomyelitis Vaccine

Dr. BARNET STROSS asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, whether, in view of the difficulty in obtaining a sufficient number of monkeys to provide the new vaccine for use against poliomyelitis, he would encourage by all possible means research on the use of an alternative medium. Mr. J. R. BEVINS stated on May 3 that the current programme of poliomyelitis research co-ordinated by the Medical Research Council might show whether there was any practicable alternative to the use of monkeys in preparing a poliomyelitis vaccine, but he was advised that an adequate substitute for monkeys was unlikely to be found in the near future for a vaccine of the Salk type. It was hoped, however, that adequate supplies of monkeys would be available again shortly.

Dr. STROSS said it was rather nauseating to think in terms of breeding and destroying so many of these tiny creatures whose kidneys had to be used. He asked for an assurance that every possible means would be used to find a substitute, which in the end might be better as well as simpler. Mr. BEVINS assured him that research to find a promising substitute was in progress.

Mr. PETER FREEMAN (Newport, Lab.) asked the Minister of Health on May 4, in view of the deaths, injuries, and paralyses that had already occurred to children injected with the vaccine obtained from the kidneys of the corpses of monkeys for the alleged cure of poliomyelitis, if he would prohibit all further experiments on children in the country by this method; and if he would give an assurance that children would only undergo this injection after the authorities had obtained the parents' prior consent in writing. Mr. IAIN MACLEOD replied that naturally the recently reported events in America were being fully considered by the Medical Research Council, and a member of their staff was going over there immediately to get first-hand information. This should be ready for study here before the routine safety tests, now being conducted on batches of vaccine, were finished, and therefore before any of the proposed trials on children over here were due to begin. Meanwhile arrangements for these trials continued. There was no intention of inoculating any child unless the full consent of the parents had been first obtained.

A Doctor's Telephone

Mr. M. EDELMAN (Coventry, North, Lab.) asked the Postmaster-General whether he had studied the case of a doctor who refused to permit his patients to call him by telephone; and whether he would make it a condition for the priority given to doctors in issuing them with telephones that they should not apply such restrictive measures to their patients who sought to summon them on legitimate occasions.

Dr. CHARLES HILL replied on May 4 that this case was the only one of its kind which had come to notice, and the doctor was not the actual subscriber. On the general issue it would be impossible to enforce the observance of such a condition as Mr. Edelman suggested, even if it were desirable to impose it.

Welfare Foods

Mr. H. MARQUAND (Middlesbrough, East, Lab.) asked the Minister of Health for a statement indicating the trend in the consumption of welfare foods since responsibility for their distribution was transferred to local authorities. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, stated on May 2 that there had been a downward trend. These foods were, of course, intended for those whose diet might otherwise be deficient, and the arrangements of the local authorities were well adapted to concentrate attention on this group. In the community as a whole the downward trend might well continue with the continuing improvement in the general diet and standard of living. In the second half of 1953 the distribution of national dried milk was 12.34 million tons; January to June, 1954, 11.92 million tons; and July to December, 1954, 11.33 million tons. The corresponding figures for cod-liver oil are: 3.28 million bottles, 3.30, and 2.79; vitamins A and D, 1.03 million packets, 1.03, and 0.83; and orange juice: 15.58 million bottles, 14.81, and 13.41. The figures were estimates.

Building Industry Accidents

Dr. BARNET STROSS asked the Minister of Labour on May 3 to what causes he attributed the increase in the accident rate in the building industry by 50% between the years 1948 and 1953, in spite of the introduction of regulations in 1948; and how he proposed to lower the rate at which men were injured in this industry. Mr. HAROLD WATKINSON replied that the apparent increase in the accident rate at building operations could be attributed, in part at least, to the efforts constantly being made by the Factory Inspectorate to secure a better understanding by employers of their obligation to report accidents in accordance with the provisions of the Factories Act. Fatal accidents, which were reported almost without exception, had not increased.

Nutritional Value of Flour

The MINISTER OF AGRICULTURE, FISHERIES, AND FOOD has arranged for an authoritative review of the scientific and medical evidence on the differences in composition and nutritional value of flour of varying extraction rates.

Lord Adrian, P.R.S., has nominated for the conduct of this review the following panel of persons:

Sir Henry Cohen (chairman), Professor of Medicine, University of Liverpool.

Professor L. J. Witts, Professor of Clinical Medicine, University of Oxford.

Professor J. H. Gaddum, F.R.S., Professor of Materia Medica, University of Edinburgh.

Dr. A. C. Chibnall, F.R.S., formerly Professor of Biochemistry, University of Cambridge.

Professor R. A. Morton, F.R.S., Professor of Biochemistry, University of Liverpool.

The formal terms of reference of the panel are:

"In the light of the scientific and medical evidence now available—

"(1) to determine the differences in composition and nutritive value between (*a*) National flour as defined in the Flour Order, 1953; (*b*) flour of extraction rates less than National flour as defined in the Flour Order, 1953, to which the three token nutrients have been restored; (*c*) flour of extraction rates less than National flour as defined in the Flour Order, 1953, to which the three token nutrients have not been restored; and

"(2) to advise whether any such differences are significant from the point of view of the health of the population.

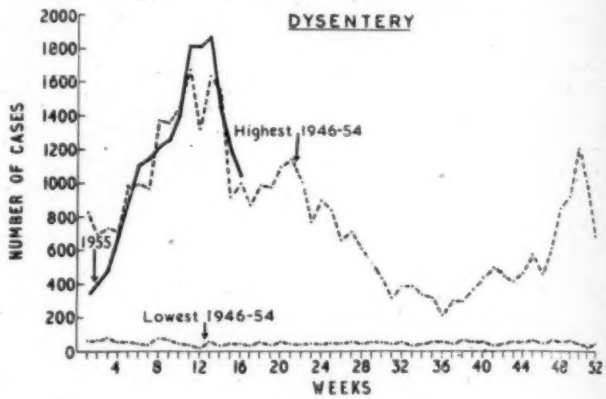
Beds and Centres.—In each year from 1951 to 1954 inclusive the number of hospital beds unoccupied through shortage of staff were 27,812, 23,013, 18,874, and 17,049 (provisional). The number of new health centres provided each year were one, three, none, and one.

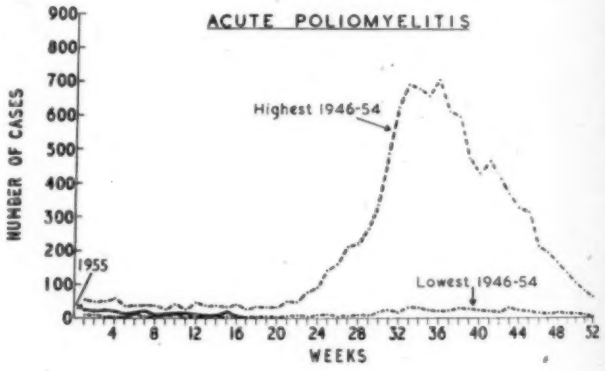
Wages and Salaries.—About £5½m. more than was estimated to have been required in 1954–5 as a result of wage and salary increases has been provided for in the 1955–6 Health Service estimates.

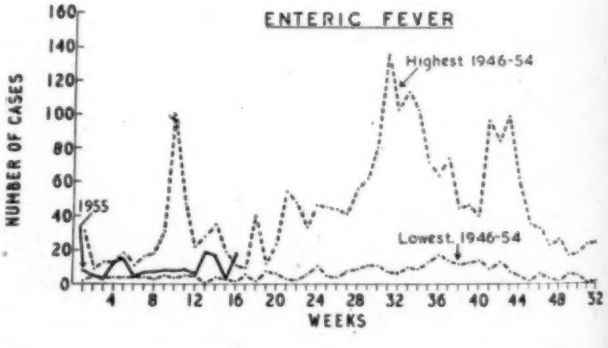
Vital Statistics

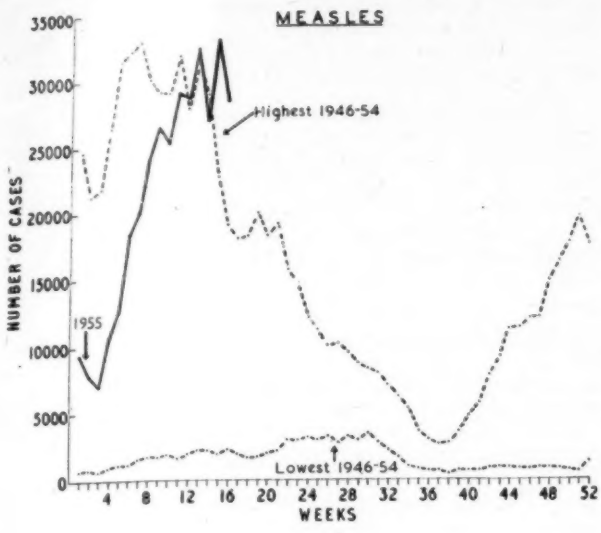
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946–54 are shown thus ------, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

A decreased incidence was recorded for most infectious diseases in England and Wales during the week ending April 23. The largest falls in the numbers of notifications were 4,544 for measles, from 32,969 to 28,425, 138 for dysentery, from 1,191 to 1,053, 130 for scarlet fever, from 597 to 467, and 116 for acute pneumonia, from 804 to 688, and the only large rise was 184 for whooping-cough, from 1,474 to 1,658.

The largest declines in the incidence of measles were 857 in Warwickshire, from 3,565 to 2,708, 677 in London, from 3,291 to 2,614, 644 in Middlesex, from 2,597 to 1,953, 439 in Kent, from 1,252 to 813, 423 in Yorkshire West Riding, from 3,726 to 3,303, and 273 in Buckinghamshire, from 652 to 379, and the largest exceptions to the general decline were increases of 166 in Southampton county, from 976 to 1,142, and 150 in Staffordshire, from 1,309 to 1,459. The rise in whooping-cough was mainly due to an increase of 99 in Middlesex, from 47 to 146, and this rise was due to an outbreak of 107 cases in Southall M.B. The largest fall in the number of notifications of scarlet fever was 39 in Lancashire, from 104 to 65. 14 cases of diphtheria were notified, being 7 more than in the preceding week; these cases involved 12 areas. 6 of the 15 cases of paratyphoid fever were notified in Durham, Sunderland R.D. 6 cases of acute poliomyelitis were notified, and these were 13 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. 2 cases were notified in Somersetshire, Yeovil R.D., and Lincolnshire, Grimsby C.B.

The largest centres of dysentery were Lancashire 422 (Oldham C.B. 80, Chadderton U.D. 62, Blackpool C.B. 33, Liverpool C.B. 32, Manchester C.B. 28, Worsley U.D. 28, Blackburn C.B. 27, Whiston R.D. 14, Crompton U.D. 12, Royton U.D. 12), Durham 149 (Felling U.D. 29, Gateshead C.B. 26, Easington R.D. 25, Seaham U.D. 24, South Shields C.B. 16, Stanley U.D. 12), Yorkshire West Riding 72 (Leeds C.B. 17, Goole M.B. 15), Leicestershire 54 (Leicester C.B. 47), Surrey 50 (Banstead U.D. 24, Beddington and Wallington M.B. 11), London 47 (Shoreditch 11, Hackney 10), Northumberland 44 (Newcastle-upon Tyne C.B. 14), Yorkshire North Riding 31 (Middlesbrough C.B. 30), and Norfolk 30 (Norwich C.B. 20).

Week Ending April 30

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 461, whooping-cough 1,768, diphtheria 9, measles 22,537, acute pneumonia 540, acute poliomyelitis 19, dysentery 879, and paratyphoid fever 15.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **April** 23 (No. 16) and corresponding week 1954.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	14	2	1	0	5	12	0	3	1	0
Dysentery	1,053	47	323	24	1	711	91	351	2	1
Encephalitis, acute	3	0		0		3	1	0	0	
Enteric fever:										
Typhoid	3	1	2	0		1	0	0	0	0
Paratyphoid	15	0	0	0		3	0	1	0	0
Food-poisoning	135	25		8		85	8		0	
Infective enteritis or diarrhoea under 2 years				12	11				8	15
Measles*	28,425	2614	267	498	280	2,196	93	184	115	405
Meningococcal infection	36	3	14	6	3	34	2	11	3	4
Ophthalmia neonatorum	48	1	8	0		35	3	7	0	
Pneumonia†	688	44	188	14	3	478	32	204	9	5
Poliomyelitis, acute:										
Paralytic	1	0	2	0	2	6	0	3	0	0
Non-paralytic	5	0				4	0			
Puerperal fever§	220	31	9	2		232	36	14	3	
Scarlet fever	467	30	55	43	17	789	58	122	32	35
Tuberculosis:										
Respiratory	788	85	155	22		706	81	148	30	
Non-respiratory	97	6	19	7		113	7	31	3	
Whooping-cough	1,658	114	86	57	64	2,133	63	314	31	25

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		1	0	0	0	
Infective enteritis or diarrhoea under 2 years	4	0	2	0	0	6	1	2	1	2
Influenza	21	1	1	0	2	12	3	3	1	1
Measles		2	0	1	0			0	0	1
Meningococcal infection		0	0				0	0		
Pneumonia	252	38	15	6	5	197	23	22	20	7
Poliomyelitis, acute	0	0			0	1	0			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	66	9	11	0	5	96	16	10	6	6
Non-respiratory		2	0	0	2			1	0	1
Whooping-cough	1	0	1	0	0	1	0	0	0	0
Deaths 0–1 year	200	30	36	7	16	218	32	26	10	28
Deaths (excluding stillbirths)	5,687	785	651	123	185	5,218	768	612	155	171
LIVE BIRTHS	7,754	1156	931	249	431	7,552	1111	1101	228	441
STILLBIRTHS	203	28	26			185	26	24		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Eighth World Health Assembly.—The assembly opened on May 10 in Mexico City under the chairmanship of last year's president, Dr. JOSEPH N. TOGBA, director-general of the Liberian National Health Service. One of the more difficult problems before the assembly is to decide how best to allocate W.H.O.'s limited resources in the field of atomic medicine: should priority be given to developing the use of radio-isotopes or to the protection of populations against radiation health hazards?

Human Trial of Live Polio Vaccine.—On May 3, at the meeting of the Association of American Physicians in Atlantic City, U.S.A., Dr. ALBERT B. SABIN, director of the Children's Hospital Research Foundation, University of Cincinnati College of Medicine, announced a successful human trial of live poliomyelitis vaccine. According to the account in the *New York Times*, Dr. Sabin reported "the finding of viruses of the three known polio types that were capable of stimulating the formation of antibodies although they did not cause polio symptoms in monkeys or chimpanzees." After 18 months' testing the characteristics of the attenuated viruses had been established, and a vaccine prepared from them was given to 26 volunteers at a Federal reformatory. "The volunteers," continues the *New York Times* report, "were between 21 and 30 years old. They swallowed doses of the attenuated polio viruses, but developed no symptoms of the infections, Dr. Sabin said. Antibodies were formed, but no signs of paralysis or other illness observed." After reading his report, Dr. Sabin is quoted as emphasizing that the work with live viruses was still "in an experimental stage," and that it might be a long time before a workable live virus vaccine could be achieved.

Salk Vaccine.—Meanwhile the Salk (dead virus) vaccine continues to claim the anxious attention of the American public. The Federal Government has recommended a further postponement of the vaccination programme, and vaccination is reported to have ceased in every state except Michigan. Dr. LEONARD SCHEELE, the U.S. Surgeon General, in a statement on May 8 said that among the five million children already inoculated with Salk vaccine there had been 50 cases of paralytic and 2 of non-paralytic poliomyelitis, 44 of which followed vaccination with the banned Cutter product. Testifying earlier before the Congressional banking committee, Dr. Scheele referred to the expert working party which is investigating these cases. Its report, he said, would determine whether the public health service would continue to examine batches of vaccine "by protocol"—that is, by close scrutiny of the maker's written evidence of safety and efficiency, a day's procedure—or whether it would have to test each batch by animal inoculation, a process, Dr. Scheele testified, that would take 28 to 33 days. A dispatch from Washington records the arrival there on May 9 of Dr. W. L. M. PERRY, the Medical Research Council's emissary (see *Journal*, May 7, p. 1166). Current British methods of screening poliomyelitis vaccine are described on p. 1204 of this issue.

Places in Special Schools.—According to a survey of physically handicapped children in England and Wales, undertaken by the Ministry of Education, there were on October 1, 1954, 1,052 children of compulsory school age awaiting places in special schools. These children were those known to local authorities whose condition came within the terms of the School Health Service and Handicapped Pupils Regulations, 1953; blind, deaf, and "delicate" children are not included. Of the total, 202 needed places in day schools, and 850 in boarding schools. Parental consent had been given in 525 of the latter cases. No less than 485 of these unplaced pupils were suffering from cerebral palsy. The next commonest conditions were poliomyelitis (100), heart defects (78), muscular dystrophy (73), and spina bifida (68). According to the Ministry enough additional boarding-school places are likely to come into use in the next two or three years to accommodate all the children whose parents are likely to consent to their attending boarding schools.

Rectorship of Edinburgh University.—On May 5, with traditional pomp, Sir SYDNEY SMITH was installed as Rector of Edinburgh University. In his address he spoke of the State's increasing monetary interest in the universities. Up to the present, said Sir Sydney, there had been no interference with the methods by which the universities carried out their functions, but "the dependence on Government grants for 75% of their expenditure may represent the writing on the wall."

Medical Candidates.—Since our list of medical candidates for the General Election was printed (*Journal*, May 7, p. 1149) two more have come forward. They are: DAVID GORDON EVANS, Buckingham, Labour (1938). Assistant General Secretary, Medical Practitioners' Union; Lecturer at London School of Tropical Medicine and Hygiene; formerly regional medical officer, J. Arthur Rank Organization; member, Association of Industrial Medical Officers; Squadron-Leader, R.A.F.V.R., 1940–6. And GERARD FOLLIOTT VAUGHAN, Poplar, Conservative (1947). Chief Assistant in the Department of Psychological Medicine at Guy's Hospital. (The date in parentheses is the year of the candidate's qualification.)

Dr. Stott Commemoration Fund.—A fund is being raised to commemorate Dr. L. B. STOTT'S 33 years' service as medical officer to the Papworth Village Settlement for the treatment and rehabilitation of sufferers from tuberculosis. Dr. Stott retired last December because of ill-health. The fund will be used for one or more of the following: Prizes for children at Papworth School; grants to children at the school or resident in Papworth who win scholarships; the erection of a shelter in the children's playing fields. Contributions should be sent to the Secretary, Dr. Stott Commemoration Fund, St. Peter's Hostel, Papworth Everard, Cambridge.

Cadmium Poisoning.—Whether cadmium poisoning should be a "prescribed disease" under the National Insurance (Industrial Injuries) Acts, and, if so, for what occupations, is being considered by the industrial diseases subcommittee of the Industrial Injuries Advisory Council. Persons and organizations interested in the question of prescribing cadmium poisoning are invited to submit written evidence. Communications should be addressed to the Secretary, Industrial Injuries Advisory Council, 10, John Adam Street, London, W.C.2, to arrive not later than June 6.

Sir Arthur Keith's Estate.—The late Sir Arthur Keith, whose death occurred on January 8 (see *Journal*, January 15, p. 168) left estate of £11,778 gross value. Among his bequests were £500 to the Royal College of Surgeons, for the upkeep of Down House, and such of his books, manuscripts, and papers as the librarian may select. He also bequeathed £500 to the Royal Anthropological Institute of Great Britain and Ireland, £200 to the Royal Medical Benevolent Fund, £100 to the Anatomical Society of Great Britain and Ireland, and 100 guineas to Aberdeen University for the anthropological museum in Marischal College.

W.H.O. Appointments.—Dr. R. M. DOWDESWELL, formerly deputy director of laboratory services in Kenya and more recently visiting professor of bacteriology at the American University, Beirut, has been appointed director of the El Calioub Public Health Demonstration Project in Egypt. Dr. T. EVANS, assistant director of medical services, Northern Rhodesia, has been appointed deputy director of the W.H.O. Regional Office for Africa at Brazzaville.

Hunterian Society.—At the annual general meeting on May 2 Mr. A. DICKSON WRIGHT was elected president for 1955–6 in succession to Dr. W. S. C. COPEMAN. Professor E. N. DA C. ANDRADE, F.R.S., gave an address on "Isotopes."

News in Brief.—Mr. C. E. ENGEL, of the photographic department of Guy's Hospital, London, won the prize for foreign medical films in this year's competition organized by the French journal *La Presse Médicale* (see *Journal*, December 11, 1954, p. 1431). His film was "Mitral Valvulotomy for Mitral Stenosis." Dr. PETER HANSELL, director of the Westminster Hospital's photographic department, was accorded an "honourable mention" for his film "Grafting on the Cornea."

Dr. L. GORDON HOPKINS was presented with the second Sydney Body gold medal at a ceremony at Southend General Hospital in March. It was awarded for his "distinguished services to medicine in Southend for the past 50 years." Dr. Hopkins is 80.

COMING EVENTS

Association of Medical Records Officers.—One-day Medical Records Exhibition at the Bonnington Hotel, Southampton Row, London, W.C.1, from 10 a.m. to 6 p.m. on May 21. Exhibition open to all interested in problems of records storage, out-patient waiting, medical correspondence and indexing. At 11 a.m. Dr. N. M. GOODMAN (Ministry of Health) will lecture on "Statistics and Records of Cancer."

Medical Association for the Prevention of War.—Annual conference on June 4, 2 to 6 p.m., at 45, Russell Square, London, W.C.1, on "The Medical Effects of Radioactive Explosions." Speakers include Dr. W. R. S. DOLL, Dr. R. H. DOBBS, and Dr. G. DISCOMBE. Open, free, to all members of the medical profession and others interested.

National Association for Maternal and Child Welfare.—Annual conference at Church House, Westminster, June 22–24. Details from secretary, N.A.M.C.W., Tavistock House North, Tavistock Square, London, W.C.1.

NEW ISSUES

British Journal of Industrial Medicine.—The next issue (Vol. 12, No. 2) is now available. The contents include:

MORTALITY FROM LUNG CANCER IN ASBESTOS WORKERS. Richard Doll.
PRIMARY LUNG CANCER IN SOUTH WALES COAL-WORKERS WITH PNEUMOCONIOSIS. W. R. L. James.
PULMONARY FIBROSIS IN NON-FERROUS FOUNDRY WORKERS. H. E. Harding and A. I. G. McLaughlin.
LEPTOSPIRAL SEROLOGY IN SCOTTISH COAL-MINERS. R. S F. Adam and P. N. Edmunds.
DIURNAL VARIATION IN MENTAL PERFORMANCE. Bo Bjerner, Åke Holm, and Åke Swensson.
PHYSIOLOGICAL OBSERVATIONS ON MEN WORKING IN SUPPOSEDLY LIMITING ENVIRONMENTS IN A WEST AFRICAN GOLD-MINE. W. S. S. Ladell.
THE INFLUENCE OF INSPIRED AIR TEMPERATURE ON TOLERANCE TO WORK IN THE HEAT. A. R. Lind.
INVESTIGATIONS INTO THE EFFECTS OF EXPOSURE TO TRICHLORETHYLENE IN MECHANICAL ENGINEERING. E. Grandjean, R. Münchinger, V. Turrian, P. A. Haas, H.-K. Knoepfel, and H. Rosenmund.
CONFERENCE OF THE BRITISH OCCUPATIONAL HYGIENE SOCIETY ON RADIATION HAZARDS IN INDUSTRY:
THE HEALTH OF WORKERS EXPOSED TO IONIZING RADIATIONS. A. S. McLean.
RADIATION SAFETY AT AN ATOMIC ENERGY FACTORY. D. R. R. Fair.
PROTECTION AGAINST *X* RAYS AND GAMMA RAYS IN THE INDUSTRIAL FIELD. W. Binks.
SAFETY CRITERIA IN ATOMIC ENERGY. F. R. Farmer.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 16

EDINBURGH UNIVERSITY—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Anaesthesia, Antiseptics, Antibiotics.
INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture demonstration by Dr. E. Stengel.
ST. ANDREWS UNIVERSITY.—At Physiology Lecture Theatre, Queen's College, Dundee, 5 p.m., open postgraduate lecture by Dr. R. Heim de Balsac (Paris): Observations on the Vascular Factor in the Radiology of the Lung Fields.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 4.45 p.m., Professor Emil L. Smith (University of Utah): Mode of Action of Proteolytic Enzymes.

Tuesday, May 17

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., annual general meeting. Dr. C. V. Bloom: The Deprived Child To-day.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. S. C. Gold: Drug Eruptions.
OXFORD UNIVERSITY MEDICAL SOCIETY.—At Maternity Lecture Theatre, Radcliffe Infirmary, 8.15 p.m., Mrs. E. J. Radley Smith: Leucotomy.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. J. D. N. Nabarro: The Adrenal Cortex and Renal Function.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almroth Wright Lecture by Dr. A. T. R. Mattick: The Lactobacilli and Some Streptococci.

Wednesday, May 18

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Prevention of Hospital Infection.
NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Aintree Hospital, Liverpool, 5.30 p.m., Dr. J. Baxter: Rehabilitation of Tuberculous Patients; Dr. J. O. O'Rourke: Escape from Sanatorium: Some Aspects of Self-determined Discharge.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor G. Payling Wright: General Pathology of Tuberculosis (III).
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Bolingbroke Lecture by Mr. A. Dickson Wright: Varicose Veins.
WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, Willesden General Hospital, 8.45 p.m., Dr. E. A. Blake Pritchard: Migraine.

Thursday, May 19

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., annual general meeting; 8.30 p.m., Dr. J. A. C. Fleming: Some Reflections on the Position and Scientific Role of the Institute.
EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: History of Medical History.
HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. J. H. Wright: Unilateral Renal Hypertension.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. C. M. Fletcher: Atmospheric Pollution and Disease.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. R. S. Harley: Subphrenic Abscess, with particular reference to the Spread of Infection.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Professor A. Corradetti: Studies on Comparative Pathology and Immunology in Mammal and Bird *Plasmodium* Infections.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Professor A. Kekwick: Obesity.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in neurology.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 4.45 p.m., Professor Emil L. Smith (University of Utah): Mode of Action of Proteolytic Enzymes.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Royal College of Physicians of London, 8.30 p.m., Cavendish Lecture by Sir Charles Dodds, F.R.S.: The Renaissance of Treatment.

Friday, May 20

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.
FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4.30 p.m., Skinner Lecture by Dr. S. Whately Davidson: Some Anomalies of the Respiratory System.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. M. B. MacKenna.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
LONDON UNIVERSITY.—At St. Thomas's Hospital Medical School, 5 p.m., special university lecture in pharmacology by Professor V. Erspamer (Bari): Biological Significance of 5-Hydroxytryptamine and Related Substances.
OSLER CLUB OF LONDON.—At Royal Army Medical College, 8 p.m., meeting in honour of Sir Anthony Bowlby, Bt. (May 10, 1855-1929). Sir Gordon Gordon-Taylor: Reminiscences of Some Famous Surgeons of the 1914-18 War.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. A. L. d'Abreu: Surgery of Congenital Heart Disease; (2) 4 p.m., Dr. I. Douglas-Wilson: Words without End.
ST. ANDREWS UNIVERSITY.—At Department of Medicine, Queen's College, Dundee, 2.30 p.m., discussion to be opened by Dr. J. Wright, Dr. R. W. D. Turner, Professor R. Walmsley, and Dr. K. G. Lowe: Pulmonary Stenosis as an Isolated Lesion and with Associated Atrial Septal Defect (Fallot's Trilogy).
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. F. S. W. Brimblecombe: Lactation and Breast Feeding.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. H. Harris: Genetic Aspects of Tubular Function.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clare.—On April 27, 1955, at St. David's Hospital, Cardiff, to Mary Hancock, wife of Deryck Edwin Clare, M.B., B.S., C.P.H., a son.
Drummond.—On April 11, 1955, at St. George's Hospital, London, S.W., to Ann, wife of Dr. P. Drummond, a son—Christopher Gordon.
Edwards.—On May 5, 1955, at Southmead Hospital, Bristol, to Hetty, wife of Errol M. Edwards, M.R.C.O.G., a daughter—Deidre.
Fleischl.—On April 25, 1955, to Charmian (formerly Quinton), M.B., B.S., wife of Peter Fleischl, M.B., M.R.C.P., a son—John Murray.
Hume.—On May 5, 1955, at St. David's Hospital, Cardiff, to Rosamond (formerly Hyslop), wife of Dr. Michael Hume, a daughter—Caroline Morwena.
Perrem.—On May 4, 1955, at Battledown Manor, Cheltenham, Glos, to Mary, wife of Dr. John F. Perrem, R.A.F., a son—Timothy John.
Watson.—On May 5, 1955, to Audrey, wife of Dr. David Lister Watson, Wiveliscombe, Somerset, a son—Neil Clarke.

DEATHS

Chilcott.—On April 9, 1955, at 26, Stormont Road, Highgate, London, N., Arthur Edward Chilcott, M.D., aged 91.
Grosvenor.—On April 12, 1955, at Salisbury, Southern Rhodesia, Harold Octavius Washington Grosvenor, M.R.C.S., L.R.C.P.
Haynes.—On April 1, 1955, at 57, Crown Street, Brentwood, Essex, Horace Guy Lankester Haynes, T.D., M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C.,T., retired.
Heesom.—On April 19, 1955, at his home, Berkswell House, High Trees, Reigate, Surrey, Alan Hedley Beecroft Heesom, M.R.C.S., L.R.C.P., L.D.S.
Macewen.—On April 17, 1955, at Gartferry, Innellan, Argyll, Hugh Allan Macewen, O.B.E., M.B., Ch.B., D.P.H.

Any Questions ?

Exertion after Hernia Repair

Q.—*Does strenuous exertion after a repair of an inguinal hernia predispose to a recurrence or does it strengthen the abdominal muscles and thus reduce the tendency to recurrence? Does the use of unabsorbable suture materials lessen the chances of recurrence after repair of a hernia?*

A.—Strenuous exertion should certainly be avoided for the first month or six weeks after a repair operation for inguinal hernia—particularly in fat or flabby patients; graduated abdominal exercises, however, are all to the good. By far the majority of recurrences after hernia operations occur within the first year, and probably two out of three of these within the first six weeks. "Hasten slowly" is therefore a good motto for this initial period.

The absorbable suture probably produces a better fibrous reaction than the non-absorbable. However, because of the likely possibility of stretching this new fibrous tissue in the fat, the flabby, the chronic bronchitic, or the patient whose occupation involves constant severe strain, in these cases more reliance should be placed on the non-absorbable materials.

Tuberculosis in Pet Monkeys

Q.—*My small children keep as a pet a Mona monkey. I have heard that there is a good deal of pulmonary tuberculosis in monkeys in captivity, and I am therefore a little doubtful about whether I should allow them to retain the animal. I have no reason to suspect that he is not in good health. I should be grateful for your advice about this.*

A.—Most species of monkey are susceptible to tuberculosis, but in the wild state do not have any opportunity of acquiring the infection. They may, however, become infected after capture, and in this case the infection will be of the primary type, often progressive and terminating fatally. Such monkeys will be dangerously infective to man.

Monkeys kept as pets should always be tested with old tuberculin, a convenient site for inoculation being the upper eyelid. A positive reaction indicates present or past infection. A negative reaction suggests freedom from infection, but does not absolutely exclude it. They should therefore in addition be examined clinically, and also radiographed for signs of pulmonary tuberculosis. The absence of any sign of infection after proper investigation should reassure the owner.

Tuberculous persons or tuberculous milk are potential sources of infection to captive monkeys.

Pineapple Finger

Q.—*I would be glad of any information or reference you can give me on the form of industrial dermatitis known as "pineapple finger" and on any other illness peculiar to people canning pineapples.*

A.—According to Schwartz, Tulipan, and Peck[1] the peeling of pineapples may cause dermatitis because of the sharp spears on the pineapple and the high content of sugar in the juice. A full account of pineapple dermatosis has been given by I. Polunin.[2] He describes erosions of the fingertips caused by a proteolytic enzyme in pineapple juice which causes separation of the superficial layers of the skin. Pineapples have long been used in cooking to soften tough meat, and photographers in the past used the juice to remove the gelatin from old photographic plates.

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[1] *Occupational Diseases of the Skin*, 1947, 2nd ed. Philadelphia.
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Testosterone for Birth Control

Q.—*Testosterone inhibits spermatogenesis. Is it of value in birth control? What possibility is there of its producing malignancy? What dose is required to inhibit spermatogenesis?*

A.—It is true that testosterone in sufficient dosage will inhibit spermatogenesis, but it could certainly not be recommended as a form of birth control. It is uncertain, for example, whether, after sufficiently prolonged administration of testosterone, testicular recovery could take place. So far as the writer knows, there is no likelihood of testosterone producing malignancy. The amount of testosterone required to inhibit spermatogenesis completely varies in different individuals, but it is probable that for most men a weekly injection of 100 mg. of testosterone phenyl propionate would, within a period of two months or so, reduce the rate of sperm production to infertile levels.

Treatment of Tinnitus

Q.—*What can be done to help a woman of 60 with severe tinnitus—periodic attacks of buzzing noises in both ears so severe that she is reduced to tears? She has been treated over the last two years with drugs, but the tinnitus has now reached a stage (attacks twice weekly lasting 1–24 hours) when none brings her any relief.*

A.—There is no specific drug or treatment that can abolish the tinnitus. If the cause be wax in the ear, fluid in the tympanum, or any of the ototoxic drugs such as quinine, salicylates, or occasionally aspirin, removal should result in the tinnitus disappearing. Troublesome tinnitus such as mentioned in the question is, however, usually due to some disturbance of cochlear function. Destruction of the cochlea or even section of the auditory nerve has been repeatedly carried out for tinnitus without success in but rare exceptions. In fact, this lack of success after the hopes of the patient may have been built up by the operation may often result in the tinnitus becoming more intolerable than ever. In itself tinnitus can do no harm, but it can be distracting, particularly to a nervous or introspective person.

Various forms of treatment designed to increase the blood supply to the internal ear have been tried, but usually give no definite relief. Very occasionally an injection of the stellate ganglion with a local analgesic may produce some temporary change, and might be tried in this case.

Indications for Vitamin B_{12}

Q.—*In what conditions is vitamin B_{12} definitely indicated? Advertisers suggest its use in a wide variety of conditions.*

A.—It has been suggested that cyanocobalamin (vitamin B_{12}) increases the weight of premature babies and underweight children, that it has some general tonic effect in adults, and that it is of value in the treatment of diabetic neuropathy. The main weight of scientific and clinical evidence does not support these claims and suggests that its use should largely be confined to the treatment of Addisonian pernicious anaemia, in which its therapeutic efficacy appears to be identical with that of liver extract, including its ability to prevent and to ameliorate the nervous complications of the disorder. Its cost is less than that of liver extract, the amount needed for injection is smaller, and it does not cause allergic reactions. In consequence it is probable that cyanocobalamin will replace liver extract in the future. It is occasionally effective in other high colour-index anaemias (the megaloblastic anaemias of pregnancy, infancy, malabsorption, and the Tropics), but in these folic acid is usually the drug of choice. Subacute combined degeneration of the cord hardly ever occurs in these latter anaemias, but it is wise for maintenance purposes to supplement folic acid with parenteral therapy with cyanocobalamin or liver extract, since severe peripheral neuritis may occur in patients taking folic acid alone for a long time.

Sympathicomimetic Drugs and Asthma

Q.—*What drugs should be included under the heading of sympathicomimetic drugs? Is it true that if such drugs are given to a child with asthma they lead to addiction, tend to make the asthma chronic, and may harm the heart?*

A.—The following drugs are included under the heading of sympathicomimetic drugs—ephedrine, adrenaline, noradrenaline, isopropyl-noradrenaline, "propadrine," methyl ephedrine, amphetamine, "paredrine," "kephrine," and "paredrinol."

Those of the above that are used in asthma do not lead to addiction, do not harm the heart, and do not make the asthma chronic. Ephedrine and adrenaline have been used for very many years and in all countries, and are generally acknowledged to be of very considerable benefit to asthmatics; in some cases adrenaline is life-saving. Side-effects such as palpitation or general excitability may occur, but these are not dangerous or harmful and can be reduced by the addition of a mild sedative such as phenobarbitone and by keeping the dose to the minimum necessary to relieve the attack.

Intolerance to Humidity

Q.—*Is it known why some individuals are intolerant of humidity? A woman of 51, formerly unaffected by tropical climates, has for the past seven years become most sensitive to increases in humidity even in the United Kingdom. Such increases precipitate headache, stifling respiration, nasal congestion, and profuse sweating of the head and neck, leading to a complaint of intolerable "heat" although the actual temperature may be moderately cool and the majority of the community feel comfortably warm or even cool. Is there any means of helping such patients to tolerate raised humidity?*

A.—This type of complaint is not unknown in some women in the Tropics at or about the menopausal age. The hyperhidrotic areas are those supplied by the cervical sympathetic, and these regions are often unaffected in anhidrotic heat exhaustion. The chief points of interest here are the long duration of the disorder and its association with humidity. On the other hand, the head, and particularly the forehead, is one of the first places, after the palms, to be affected in emotional sweating. As the patient also gets headaches, this may indicate that the trouble is psychogenic rather than endocrine in origin.

Presumably the questioner means relative humidity. When the relative humidity is high sweating anywhere is more apparent, as the "saturation deficit" is low and hence evaporation slow. There is, however, no physiological reason for humidity to affect heat loss and hence stimulate sweating in a resting clothed subject until the air temperature reaches 75° F. (23.9° C.), or in a nude man until it reaches 85° F. (29.4° C.): these limits are lower for working subjects. Provided there are no obvious signs of humidity, such as damp walls, men are as comfortable in 80 or 90% relative humidity in air at 60–70° F. (15.6–21.1° C.) as in lower humidities. On damp overcast days, however, the diffuse sky radiation, which cannot be avoided like sunlight, is very much greater than on clear dry days; recent work suggests that thermal radiation to the skin causes an increase in the heart rate, independent of any effect due to a raised body temperature; and it is well known that thermal radiation from any source if it warms the skin results in nasal congestion ("nose closing" effect); this may be of importance in specially sensitive persons. These effects, combined with the impossibility of getting any shade from a diffuse radiation which comes from all over the sky, might well be a precipitating factor in psychogenic sweating. The bad temper and vague malaise often complained of by people in sub-tropical regions during winds carrying high fine dust, such as the Khamseen or Harmattan, may also be caused in this way, as dust has the same effect as water vapour in diffusing solar radiation.

Pityriasis Rubra Pilaris

Q.—*I have a patient suffering from pityriasis rubra pilaris of long standing. He has visited skin specialists in this country (Ireland), England, and on the Continent, but unfortunately nobody has helped him. Is there any modern advance in the treatment of this condition? Would the topical application of cortisone benefit him?*

A.—It is generally accepted that pityriasis rubra pilaris is extremely resistant to treatment. A temporary improvement can sometimes be produced by the use of salicylic acid ointment, and irritation may be relieved by the usual measures.

In recent years this disorder has been treated by the administration of vitamin A concentrate, 24,000 units two or three times daily continued for some months. In some cases apparently there is a definite improvement, but more often the results are indecisive and some cases are not helped at all. However, the treatment is probably worth a trial.

I have no information regarding the local application of cortisone in this disease. Pityriasis rubra pilaris is usually thought to be a naevoid condition, and, on general principles, one would not expect improvement to follow the application of cortisone.

Significance of Nocturnal Polyuria

Q.—*I should be very grateful for any information about the possible causes of nocturnal polyuria with frequency. The case in which I am interested is that of a man aged 76 in normal general health. For the past 10 years he has been troubled with nocturnal frequency of micturition—about five or six times between the time of going to bed (about midnight) and rising (7 a.m.). Between 35 and 40 ounces (about a litre) of urine is passed, of S.G. 1010, neutral in reaction, and with no abnormal constituents. Practically no fluid is taken after dinner at 7.30 p.m., and then only half a pint of cider (284 ml.) as a rule. During the day there is no polyuria or frequency. There is no palpable enlargement of the prostate, and there has never been any difficulty in passing urine. I remember reading in the "Journal" some years ago that prisoners of war were troubled by nocturnal polyuria, but do not remember if any explanation of the condition was offered.*

A.—In health, the rate of urinary excretion of water, sodium, potassium, and chloride is less during the night than in the day. This patient shows a reversal of this diurnal rhythm, with nocturnal polyuria rather than oliguria. This abnormality tends to occur in any condition in which there is expansion of the extracellular fluid volume due to sodium retention. It has been found, as stated, in starvation,[1] in congestive heart failure with or without oedema, in cirrhosis of the liver,[2] and during treatment with cortisone.[3]

The most likely cause in a patient of 76 is incipient heart failure. This symptom of nocturnal polyuria may occur at a stage when there are few signs of failure, and where the only other symptom is exertional dyspnoea. It is suggested that treatment by restriction of dietary salt might result in considerable relief. If there is other evidence of heart failure—e.g., increase of jugular venous pressure or cardiac enlargement—digitalization would be of great benefit.

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[3] Rosenbaum, J. D., Ferguson, B. C., Davis, R. K., and Rossmeisl, E. C. (1951). Ibid., **31**, 507.

Syphilis and Sterility

Q.—*How does syphilis cause sterility? Is its action to be explained simply on the basis of gummatous changes in the gonads? How often are the ovaries affected?*

A.—Syphilis may cause male sterility, either by gummatous changes in the testis; by obstruction of the epididymal canal with cellular debris; or by secondary testicular failure due apparently to impairment of the gonadotrophic stimulation of the testis. In this last case it would seem that the testicular failure is part of a more generalized pattern of endocrine dysfunction.

In the female, syphilis by no means regularly results in sterility, though the sequence, abortion—stillbirth—syphilitic live-birth—normal live-birth, is a well-known one. It is doubtful if the ovaries are at all commonly directly affected by syphilis.

Nowadays, syphilis is a relatively rare, and an increasingly less common, cause of infertility. This of course is the result of the much more effective means of treating the early stages of the disease now at our disposal.

Hymenolepis Nana Infections

Q.—*What is the best treatment for infection with Hymenolepis nana? I have had no success with male fern, mepacrine, and chloroquine.*

A.—This is a difficult worm to eradicate, though fortunately, except in very heavy infections, it seldom gives rise to symptoms. It is advisable to starve the patient for 48 hours before administering the anthelmintic and to follow the treatment with a saline purgative. As the adults live in the upper ileum it is important that, whatever the anthelmintic used, it should be liberated in this region. For this reason capsules of male fern are less suitable than a draught such as extract of male fern (extractum filicis) 90 minims (6 ml.), syrup of ginger 90 minims (6 ml.), peppermint water to 1½ oz. (42 ml.). Male fern administered in this way is probably the best of the anthelmintics available, but another which might usefully be tried is hexylresorcinol.

Peripheral Neuritis after Isoniazid

Q.—*Can you give me any information on the development of acute peripheral neuritis due to the administration of isoniazid?*

A.—Peripheral neuritis may occur in patients receiving large doses of isoniazid (6–10 mg., or more, per kilo per day). It is very rare indeed in patients receiving 200 mg. daily (or 3 mg./kilo), the standard dose used in the Medical Research Council trials. The neuritis is probably a direct toxic effect and not an allergic reaction. It usually clears up when the drug is stopped, or even, in the milder cases, if the dose is lowered.

NOTES AND COMMENTS

Hairy Tongue.—Dr. W. TOMASZEWSKI (Edinburgh) writes: In your answer ("Any Questions?" April 9, p. 924) the parasitic theory is given as one of the causes of hairy tongue. It is an old textbook story which is totally lacking in proof. Although the presence of some types of fungi (mainly monilia) has been described, in a number of cases inoculation of the tongue with these fungi has failed to reproduce the clinical condition. The presence of fungi is incidental, the matted long filiform papillae being a favourable nidus for their growth and persistence. The same types of fungi can be found also on a normal tongue. Conversely in nearly 50% of cases of idiopathic, black, hairy tongue the presence of fungi has not been demonstrated.[1] There is also a statement that "recently studies of the tongue with Wood's light have shown that the flora of the dorsum of the tongue may change very rapidly in the apparently normal, healthy mouth. . . ." This is not a wholly true statement, as examination in Wood's light merely enables one to follow changes in the fluorescence of the tongue.[2] The changes of the bacterial flora on the tongue can be reliably ascertained only by microscopical examinations of tongue scrapings. I wrote about these spontaneous changes of bacterial flora in a recent letter.[3] I have made a large number of examinations of the bacterial flora in black tongue, but so far there is no evidence that any particular microflora is associated with the occurrence of this condition.

REFERENCES

1 Tomaszewski, W., *British Medical Journal*, 1953, **1**, 1249.
2 —— Ibid., 1951, **1**, 117.
3 —— Ibid., 1954, **2**, 1420.

OUR EXPERT writes: I would not agree that the parasitic theory of black hairy tongue can be ruled out, if for no other reason than the excellent therapeutic results obtained with gentian violet, but it may well be that *Candida albicans*, when present, serves to keep the condition going.[1 2] I am a little surprised that anyone could think it possible to study the flora of the tongue without a microscope, and to avoid further ambiguity let me also add that such studies of fluorescence of the tongue not only need Wood's light and a miscroscope but appropriate cultural aids as well. Finally, Laskaris and Curtis[1] report a fairly consistent microflora with hairy tongue, so it would seem that much more work will have to be done on the bacteriology and mycology of these lesions before it will be safe to dogmatize about them.

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1 Laskaris, T., and Curtis, G. D., *J. invest. Derm.*, 1949, **13**, 99.
2 Ronchese, F., and Kern, A. B., *Arch. Derm. Syph. (Chicago)*, 1953, **67**, 503.

"Once a Caesarean."—Dr. D. F. BRUCE (Glasgow) writes: I should like to comment on two points raised by your expert under the heading "Once a Caesarean" ("Any Questions?" April 16, p. 983). Firstly it is unnecessary to anaesthetize the patient in order to examine the scar of a previous lower-segment caesarean section. Provided that this examination is carried out immediately after completion of the third stage of labour, satisfactory exploration of the lower uterine segment is possible without causing discomfort. This is the routine practice in the Obstetric Unit of the Southern General Hospital, Glasgow. The second point concerns the risk of rupture of a transverse lower-uterine-segment scar in subsequent labour. In a short series of 54 cases of labour following caesarean section[1] there was no instance of rupture of the uterus. In 41 of these cases the previous caesarean section was of the lower-segment type, the incision having been transverse in each instance. In four cases the labour was the second following caesarean section. In no case was sterilization indicated. These cases were, of course, selected as being suitable for trial of labour.

REFERENCE

1 Bruce, D. F., *Glasg. med. J.*, 1953, **34**, 354.

OUR EXPERT writes: In practice, most women with a caesarean section scar in the uterus are delivered with forceps applied prophylactically, so some sort of anaesthesia is already in use when labour is complete. In other cases it is a matter of opinion whether an anaesthetic should be administered for the sole purpose of exploring the uterus, and there are arguments for and against. Often, as Dr. Bruce says, the scar can be palpated satisfactorily without anaesthesia, provided the patient is in the lithotomy position. Dr. Bruce's statistics on the risk of rupture of the scar are valuable and go to swell those which have been appearing in various medical journals and maternity hospital reports during recent years.

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